

SUPPLEMENT.

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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No. 2521.—Vol. LIII.

LONDON, SATURDAY, DECEMBER 15, 1883.

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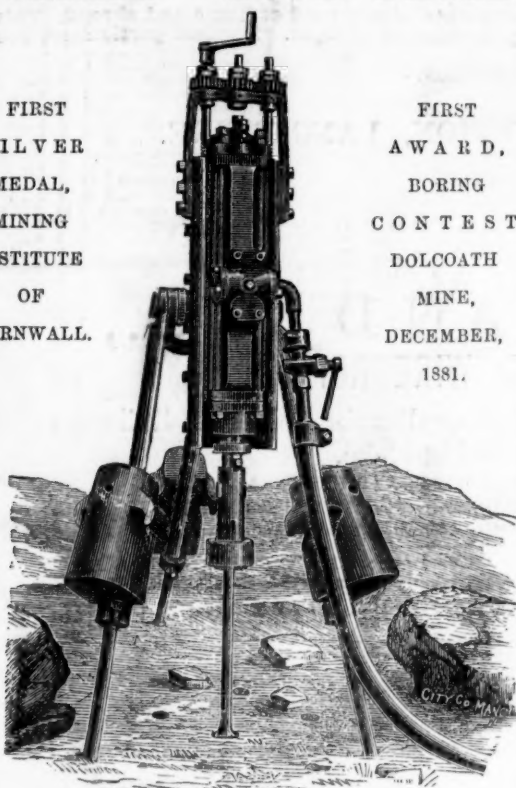
FIRST SILVER MEDAL, ROYAL CORNWALL POLYTECHNIC
—Highest Award for Effectiveness in Boring, and Economy in
the Consumption of Air

JUBILEE EXHIBITION, 1882.

THE PATENT

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MEDAL,
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AWARD,
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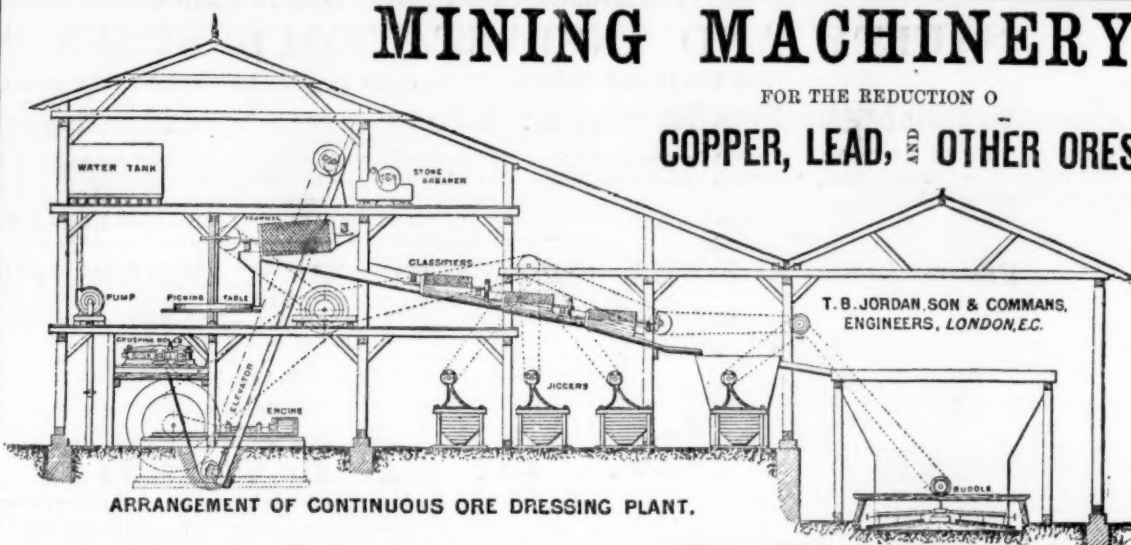
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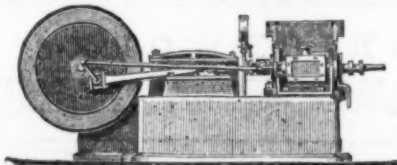
THE PATENT

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"RELiance AIR-COMPRESSOR."

First Silver Medal awarded at Boring Competition, East Pool Mine, Sept. 1883.

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Note the **TRADE MARK**: Two Separate threads through centre of Fuse.

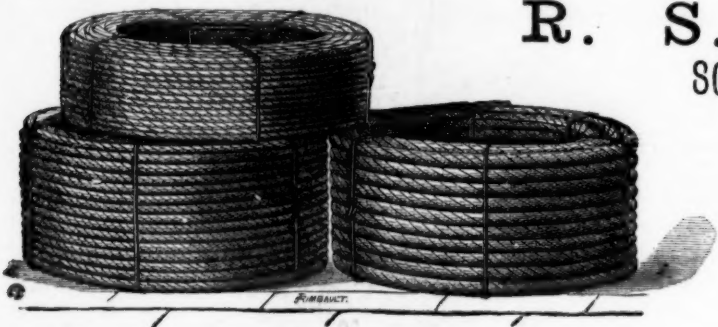
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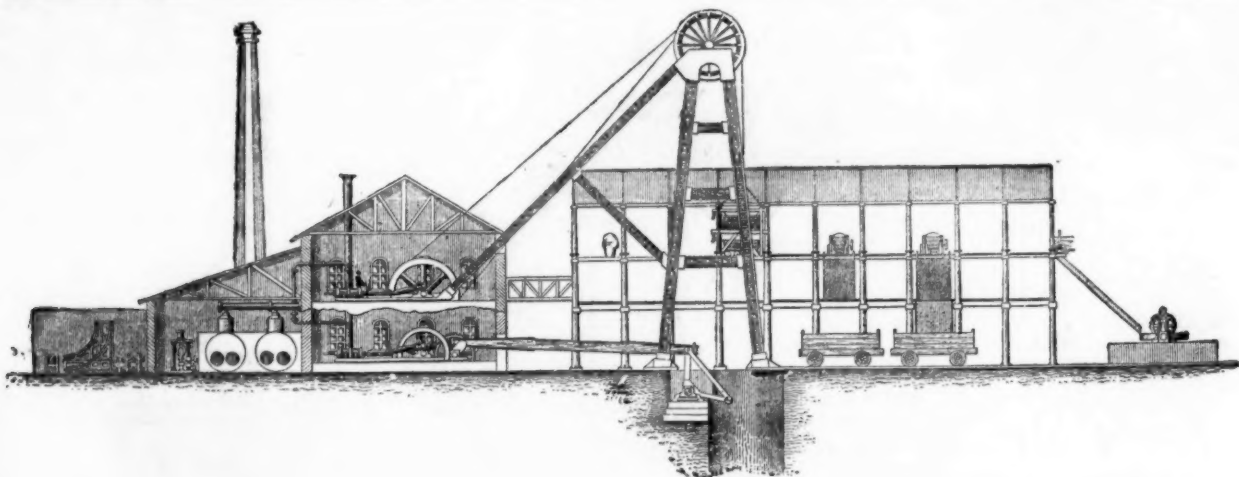
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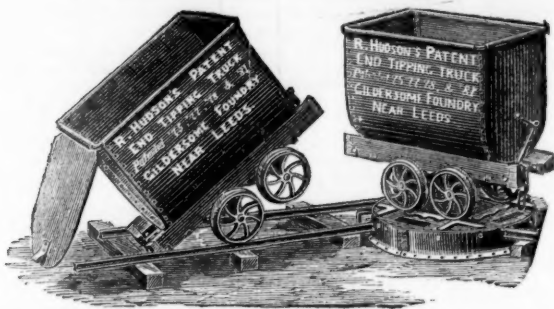
UPWARDS of 25,000 of these Trucks and Wagons have been supplied to the South African Diamond Mines; American, Spanish, Indian, and Welsh Gold, Silver, Copper, and Lead Mines; Indian and Brazilian Railways, and to Railway Contractors, Chemical Works, Brick Works, and Coal and Mineral Shippers, &c., &c., and can be made to lift off the underwork, to let down into the hold of a vessel, and easily replaced. They are also largely used in the Coal and other Mines in this country, and are the **LIGHTEST, STRONGEST**, and most **CAPACIOUS** made, infinitely stronger and lighter than wooden ones, and are all fitted with R. H.'s Patent "Rim" round top of wagons, requiring no rivets, and giving immense strength and rigidity. End and body plates are also joined on R. H.'s patent method, dispensing with angle-irons or corner plates.

Patented in Europe, America, Australia, India, and British South Africa, 1875, 1877, 1878, 1881, and 1883.

N.B.—The American, Australian, Indian, and Spanish Patents on Sale.

CAN BE MADE TO ANY SIZE, AND TO ANY GAUGE OF RAILS.

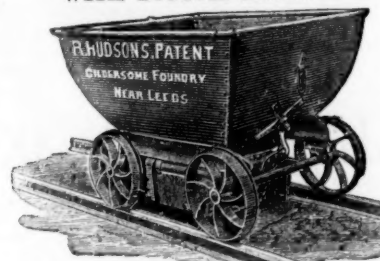
1.—PATENT STEEL END TIP WAGONS.



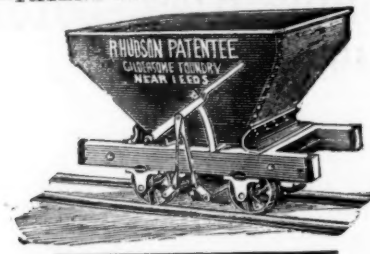
7.—PATENT STEEL MINING WAGONS.



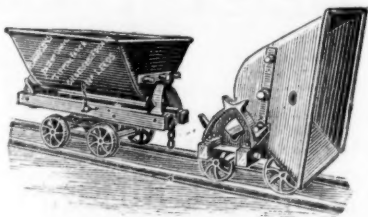
12.—PATENT STEEL HOPPER WAGON, WITH BOTTOM DOORS.



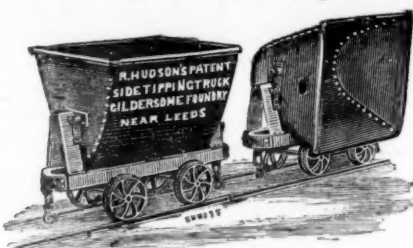
13.—PATENT STEEL HOPPER WAGON.



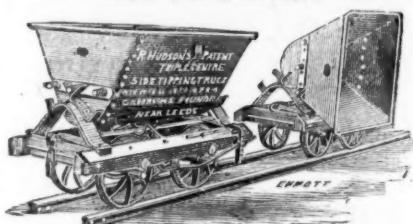
2.—PATENT UNIVERSAL TRIPLE-CENTRE STEEL TIPPING TRUCK, Will tip either SIDE or either END of rails.



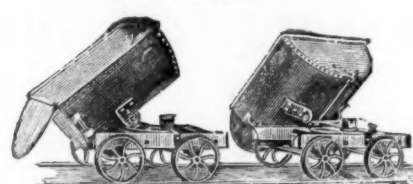
8.—PATENT DOUBLE-CENTRE STEEL SIDE TIP WAGONS, Will tip either side of Wagons.



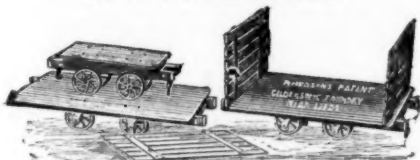
3.—PATENT TRIPLE-CENTRE STEEL SIDE TIP WAGONS.



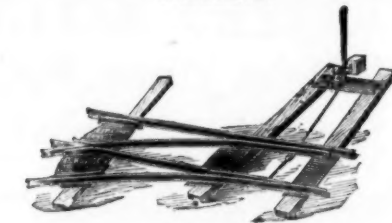
9.—PATENT STEEL ALL-ROUND TIP WAGON.



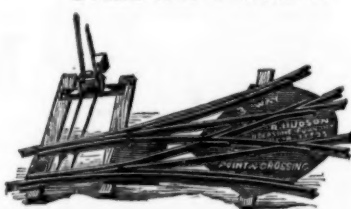
4.—PATENT STEEL PLATFORM OR SUGAR CANE WAGON.



10.—LEFT-HAND STEEL POINT AND CROSSING.



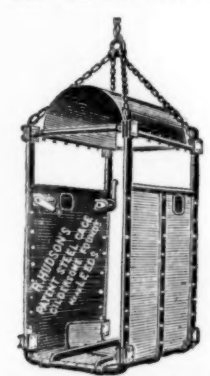
11.—RIGHT AND LEFT-HAND STEEL POINT AND CROSSING.



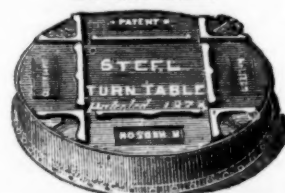
14.—SELF-RIGHTING STEEL TIP BUCKET. (The "CATCH" can also be made SELF-ACTING if desired.)



15.—STEEL CAGE.



17.—STEEL SELF-CONTAINED TURNTABLE.



(Also made in CAST IRON for use where weight is not a consideration.)

16.—PATENT STEEL WHEELBARROWS. Made to any Size. Lightest and Strongest in the Market.



A great success.

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Largely employed in the South African Diamond Fields.

No. 19.—PATENT STEEL CHARGING BARROW, DOUBLE the STRENGTH & much LIGHTER than ordinary Barrows.

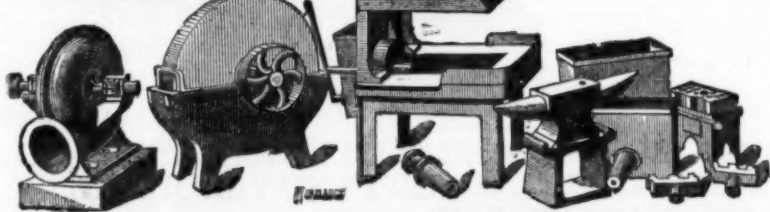


5.—PATENT STEEL CASK. As supplied to H.M. War Office for the late war in Egypt. DOUBLE the STRENGTH of ordinary Casks without any INCREASE in weight. (Made from 10 gals. capacity UPWARDS to any desired size.)



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ALL KINDS OF BOLTS, NUTS, AND RIVETS MADE TO ORDER ON THE PREMISES

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BELL'S PATENT ASBESTOS BLOCK PACKING, for High Pressure Engines. This Packing has been specially designed to overcome the difficulties experienced by engineers and others in the practical working of engines of the most modern type of construction. The greatly increased skill and workmanship now obtained in the construction of engines and boilers have led to a rapid increase in the working pressure, the object being the attainment of a high rate of speed combined with economical working, the practical advantage of which, however, cannot be realized unless the Packings are so constructed as to avoid stoppages for the purpose of re-packing the stuffing boxes.

It is now a recognised fact that the most perfect heat-resisting material suitable for the purpose of a Packing is Asbestos, but to ensure a successful application of this fibre, great skill is required in its selection and manufacture. In this Packing the Asbestos is woven into a stout cloth, and owing to the peculiar way in which it is manipulated, great elasticity is imparted to the Packing. So successfully has this been done, that with light screwing, it has been found in practice that little or no lubricant is required to ensure a minimum amount of friction, and to keep the rods from over-heating. An improved vacuum is always maintained by the use of this packing, which meets with unqualified approval wherever it is applied.

The Patent Block Packing is square, as Fig. 1. and Figs. 2 and 3 represent the Round Block Packing with solid and hollow rubber core, and Fig. 4 without core, but with rubber inlaid.

An Engineer writes as follows:—"The Asbestos Block Packing works splendidly. I have never seen its equal. We keep our gland nuts so that you can move them with finger and thumb, and can maintain a constant vacuum of 28½ in."

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BELL'S ASBESTOS YARN and SOAPSTONE PACKING for Locomotives, and all Stationary Engines running at very high speed with intense friction.

The following Testimonial refers to this Packing:—

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 DEAR SIR,—I have much pleasure in saying that the Asbestos Yarn and Soapstone Packing gives every satisfaction; indeed better than we expected. We have a locomotive packed with it, which has been running five months (and think of the piston speed with our small wheels). I think the Soapstone a great improvement, as it keeps the packing elastic, and prevents it getting hard. I am very pleased with its working, and also the very low price for such good lasting Packing. The Asbestos Yarn we find is very useful, and answers admirably.
 Yours truly,
 W. WILLIAMS.

Every 10 ft. length of Bell's Asbestos Yarn and Soapstone Packing bears a special label with the Trade Mark, and engineers are earnestly requested to see that this label is attached, to prevent imposition by worthless imitations.



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 To avoid spurious imitations, and to secure the receipt of genuine goods, all orders should be sent direct to the under-mentioned addresses, and not through Agents or Factors.

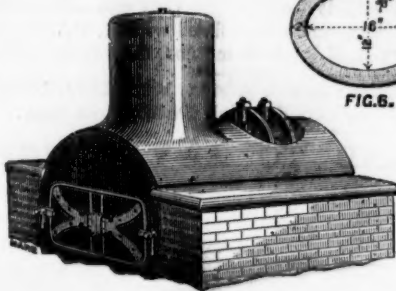


FIG. 5.

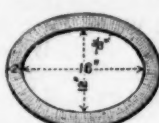


FIG. 6.



FIG. 1.

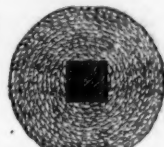


FIG. 2.

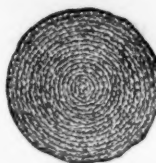


FIG. 4.

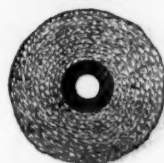


FIG. 3.

BELL'S ASBESTOS BOILER & PIPE COVERING COMPOSITION, for coating every class of steam pipes and boilers, non-combustible and easily applied when steam is up; adheres to metals and preserves them from rust; prevents the unequal expansion and contraction of boilers exposed to weather; covers 50 per cent. more surface than any other coating, and is absolutely indestructible. It can be stripped off after many years' use, mixed up with 20 per cent. of fresh, and applied again. The composition is supplied dry, and is only to be mixed with water to the consistency required for use.

A Horizontal Boiler, 17 ft. 6 in. long, 15-H.P., gave the following results:—

Temperature on Plates - - - 196 deg.
 " Covering - - - 94 deg.

1 ton of coal was saved per week, and although the fire was raked out every evening, 20 lbs. of steam were found in the boiler next morning.

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 DEAR SIR,—It may interest you to know that we save exactly 40 per cent. in fuel through using your covering.
 Yours truly,
 W. SANTO CRIMP, C.E., F.G.S.

BELL'S ASBESTOS and INDIA-RUBBER WOVEN TAPE and SHEETING, for making every class of Steam and Water Joints. It is the most efficient material for making bilge water pipe joints. It can be bent by hand to the form required without puckering, and is especially useful in making joints of manhole and mudhole doors; also for large "still" joints where boiling fat and steam have to be resisted. It is kept in stock in rolls of 100 ft., from ¼ in. (Fig. 6) to 3 in. wide, and any thickness from ¼ in. upwards. Manhole covers can be lifted many times before the renewal of the jointing material is necessary.

The same material is made up into sheets about 40 in. square, and each sheet bears my Trade Mark, without which none is genuine.

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 DEAR SIR,—I have much pleasure in informing you that I have used your Asbestos and India-rubber Woven Sheeting and Tape with great satisfaction. Some of the Tape has been in use nearly 12 months on the pump-cover joints, and situated as I am where there is no storage for the sewage, always obliged to keep one engine running, the facility and great saving of time in taking up a cover jointed with your Tape is a very important consideration.—Yours truly,
 J. ASHCROFT, Chief Engineer.

It is very necessary to guard against imitations of this useful material, and to secure themselves against being supplied with articles of less value at my price, users are recommended to see that every 10 ft. length of the Asbestos Tape purchased by them bears my Trade Mark.

BELL'S SPECIAL LONDON-MADE ASBESTOS MILLBOARD, for Dry Steam Joints, made of the best Asbestos fibre, is well-known for its toughness and purity, and is absolutely free from the injurious ingredients frequently used to attain an appearance of finish, regardless of the real utility of the material. Made in sheets measuring about 40 in. square, from 1-64th in. to 1 in., and ¼ millimetre to 25 millimetres thick. Each sheet bears my Trade Mark.

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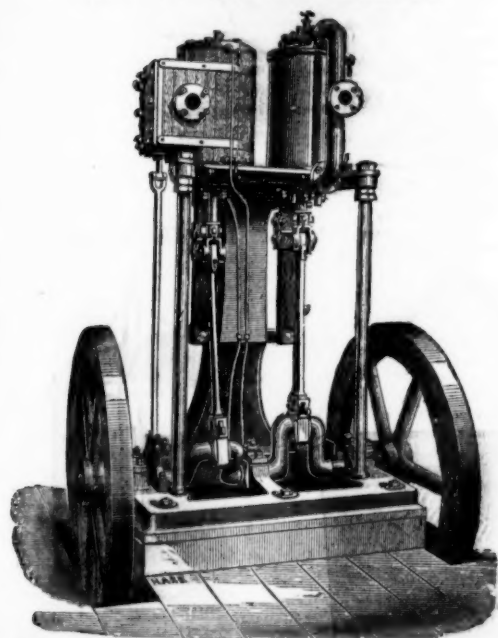
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21, RITTER STRASSE, BERLIN.

THE "Champion" Rock-borer AND AIR COMPRESSOR.



As an instance of the actual work done by this Machinery in various kinds of ground, some of it the hardest rock, it may be mentioned that in Cornwall, irrespective of the work performed by the "Champion" Rock-borers and Air-compressors purchased by various Mines, the drivage, rising, sinking, and stoping done by contract by the Proprietor with his own Machinery now amounts to over 1150 fathoms.

Several of these Air-compressors, ranging from 3½ to 12 tons in weight may be seen in constant work in the Camborne Mining District.

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ESTABLISHED 1852.

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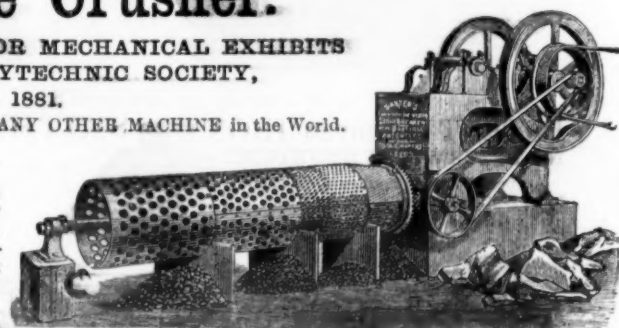
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NOTE THIS FACT.

To Mr. Baxter, Leeds. *Cinderford, Feb. 13, 1883.*
 DEAR SIR,—I am pleased to be able to tell you that the Machine works splendidly. We are breaking 16 trucks a day now, and we thought it a good day's work to do 10 a day with the old Machine, so you can see the difference. I had a gentleman looking at it yesterday, and he was surprised to see it work so easily.
 Yours truly,
 E. ORGAN.

The above refers to one of our 16 by 9 Machines we supplied to replace an "Improved Blake" 15 by 9 Machine.



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AWARDED THE ROYAL MANCHESTER, LIVERPOOL, AND NORTH LANCASHIRE AGRICULTURAL SOCIETY'S SILVER MEDAL, 8TH OF SEPTEMBER, 1882.

FOR ILLUSTRATED CATALOGUE AND FULL PARTICULARS ADDRESS TO THE PATENTEES AND SOLE MAKERS,

W. H. BAXTER & CO., ALBION STREET, LEEDS.

Original Correspondence.

ST. JOHN DEL REY COMPANY, AND THE CATTABRANCA BLACKS.

SIR.—The paragraph with the above heading, but unsigned, appearing in your valuable Journal of Oct. 13, is calculated to give a wrong impression in regard to the parties concerned, and would, if correct, go far to justify the remarks already made, for it is abundantly evident that if the excuses put forward were facts, such an amount of innocence and want of business knowledge is quite incompatible with the important position of a superintendent of a company. I will relate the facts, and the public can judge.

An agreement was made in London on May 5, 1845, between the St. John del Rey Company and the Brazilian Company (called in Brazil the Catta Branca Company), by which all the property of the Brazilian Company was transferred to the St. John del Rey Company, and it also stipulated for the hire of the slaves of the Catta Branca Company to the St. John del Rey Company for a term of 14 years. This contract was superseded by another agreement, dated June 27, 1845, for the sale of properties, and another contract for the hire of the slaves.

The reason for having the sale of lands and effects, and the hiring of the slaves separately, will presently appear. The hiring was for 14 years, ending in 1859. All the children of the slaves were to be freed as they came of age, and all children born would be free at the ending of the contract, together with all the people in the schedule to the contract, and thus everyone would at the end of 1859 be free. The St. John del Rey Company solemnly undertook to carry these provisions into effect. There are no records of any of the children as they came of age being freed. This was the first breach of the agreement. If they had been freed as above at the end of 1859 there would have been but few comparatively left to receive their freedom; but as their services were very valuable they were kept in slavery in defiance of all law and justice.

In due time, conformably to contract of June 27, 1845, the slaves, men, women, and children, to the number of 385, were delivered over to the St. John del Rey Company at Morro Velho by the Catta Branca Company. The above contract for the hire of these slaves was sold to third parties in liquidation of the Brazilian Company; and after this this company became finally extinct, and had no further corporate existence. This latter is proved by a letter of liberty given to the child of two of the slaves, named Matthias B. and Lucinda, signed by Thomas Walker on Sept. 19, 1856, the then superintendent of the St. John del Rey Company, at Morro Velho in pursuance of the contract of 1845; and again on June 24, 1869, Mr. J. N. Gordon, as superintendent of the St. John del Rey Company, and still in pursuance of the same agreement of June 27, 1845, between the two companies, declares the Catta Branca "to be extinct." This is in a letter of liberty granted to Antonio C. Mozambique.

I call particular attention to these two cases. This Black applied in 1859 for his freedom under the terms of the contract to Mr. Gordon, which Mr. Gordon refused, saying he must serve 10 years longer, and he did so. I repeat that this man had a right to his liberty in 1859 under the contract, and was further entitled by reason of the money he had in the Catta Branca Emancipation Fund, which appears to have evaporated. The extinction of the Brazilian or Catta Branca Company is clearly shown by the above letters of freedom, which are public documents. How, then, can Mr. Gordon plead ignorance of the liberating clauses of the contract of June 27, 1845?

I now proceed to show the reason of the division of the deed of agreement of May 5, 1845, into two deeds, one for letting the slaves, and the other for selling the property. By the law of Brazil a deed of sale of property requires registration; a contract for letting slaves does not, and, therefore, could be kept in the back ground. From 1859 to 1871 there was continual grumbling at Morro Velho, and it was always alleged that the Blacks of the Catta Branca Company were illegally detained. One man who had been a clerk of the Catta Branca Company, and afterwards employed by the St. John del Rey Company, left that company in disgust at the dishonourable treatment of these Blacks because they had none to help them; and he gave this as a reason for leaving. The contract for the sale of the property found by Mr. Gordon on arrival at Morro Velho makes reference to the contract for the hire of the Blacks. It is rather trespassing on our benevolence for Mr. Gordon to endeavour to foist upon us the belief in view of the dividends declared under his administration that he so little attended to the affairs of the St. John del Rey Company at Morro Velho. Finding the Blacks had been there so many years he had not even the curiosity to ascertain the conditions under which they were retained at Morro Velho, or why they were there even if it were only to make provision for working the mine in case such a large number of the miners would be at liberty to leave at any moment. This they would most undoubtedly have done had they known their true position as free men on Jan. 1, 1860. I call attention to this point as judgment was pronounced against the Morro Velho Company that they were free men at this date.

Matters went on till the Law of Registration of Slaves, No. 2040, of Sept. 28, 1871, was passed. Now, it would be a natural proceeding of a superintendent who had a large body of people under his charge to enquire as to their position, and how the law of Brazil related to them. It must be kept in mind that the law was for the registration of slaves and not of free people. And these free people had been kept in slavery for a period of about 11 years. This Act must have come like a bombshell on Mr. Gordon and the St. John del Rey Company, as under the law "all Blacks having no owners were declared free." This placed Mr. Gordon and the company upon the horns of a dilemma. If Mr. Gordon sent them away from the mine some sharp Brazilian lawyer would have got hold of them and brought about 213 actions against the company, each for between 11 and 12 years' wages as free people, and damages for detention, amounting in the aggregate to several thousands of pounds. What was to be done? Nobody but the directors in England and Mr. Gordon knew the contents of the contract. What more easy on account of the defective regulations for carrying into effect the law of 1871 to supplement the injustice of having kept them in slavery for a period of about 11 years than by effecting a greater injustice, and making them *bona fide* slaves for life? Philanthropists compare this with the original kidnapping of slaves in Africa, or the proceedings of Pharaoh in Egypt. Pharaoh for bricks; Gordon for gold. The signature of Mr. J. N. Gordon to the registration for the reduction to slavery of these free people is to be found in the office of the collector at Sabará. Thus are retained captive children and grandchildren of the original Blacks for life, Mr. J. N. Gordon standing sponsor. The date of this document is April 29, 1871. I refrain from playing upon the emotional sympathies which these facts must elicit. The defender of Mr. Gordon states that it was Mr. Gordon's duty to register these Blacks. Mr. Gordon by an apparent compliance was actually violating the law of 1871, for it was laid down by the Barao of Rio Branco, the author of the law, that "no one could be matriculated as a slave who had upon him the onus of liberty."

The document Mr. Gordon is stated to have received and called by the defender a "power of attorney" is curious and most interesting. Unfortunately for the defence it is dated Aug. 6, 1871, about three months after the registration had taken place—April 29, 1871, and which it was presumed to authorise. At that date, Aug. 6, 1871, three persons calling themselves the "directors of the Brazilian Company formerly established at Catta Branca," but whose names do not appear in the former liquidated directorate of 1845, signed a document purporting to be a kind of "letter of instructions," and which is not, therefore, a power of attorney. This precious document is witnessed only by clerks of the St. John del Rey Company in London, one of whom appears to have had a somewhat tender conscience. To make this paper appear important, and more in conformity with the practice of this Empire; and as a means to blind the officials, if necessary, the farce of going before a magistrate, swearing and affirming to the signatures of the resurrected board of directors of the long extinct Brazilian Company, is gone through. Now, this document referred to as a power of attorney mentions no meeting nor resolutions of the resurrected board of directors, appears to have no seal

of the company, no office address, and bears none of the marks of an honest legally executed instrument.

So much for the so-called "power of attorney." This evidently was an after-thought, to be used should any occasion like the present arise. What can more than this demonstrate the zeal of Mr. Gordon for reducing people to slavery? These Blacks were registered slaves April 29, when there was no necessity so to do until Nov. 30 following. Mr. Gordon's defender states in the last paragraph that the hire of these Blacks was paid in England, and this with the utmost regularity, which no doubt is the truth, but not the question as regards Mr. Gordon; but the wages never reached the slaves, and is, therefore, a matter of account between shareholders and directors. Mr. Gordon, of course, saw the balance-sheets of the company, and must have noticed that after 1859 the item of payment on account of Catta Branca contract did not appear. If he had not well known the full contents and conditions of the contract should not this have prompted him to make enquiry, and ascertain if he was doing justice to the unfortunate people under his control as superintendent?

The regular payment of the wages explains the whole matter. It would have been prejudicial to let two or three hundred people go free if by retaining them in slavery a large income could be regularly obtained from them, and a permanent body of working hands kept in operation. The value of this is known only to those who have carried on large works in Brazil. I understand the defender of Mr. Gordon to indicate that the directors of the company are responsible to these Blacks for the wages for 17 years.

Finally, to resume, we have the contract of 1845.—1. Mr. Gordon's arrival in Brazil before its expiration.—2. The fact of the children not being freed as they came of age.—3. That the Brazilian Company had been declared extinct by Mr. Gordon himself.—4. Mr. Gordon's acceptance of an extraordinary document from improvised directors for an act he had already consummated.—5. The registration papers with his signature.—6. The fight before the Brazilian Courts of Law to nullify this illegal act.—7. This last cost thousands of pounds sterling.

Your readers can now come to a right conclusion on the whole question. Mr. Gordon has evidently calculated that time must elapse before an exposition could be placed before the public.

Ouro Preto, Nov. 4. CHAS. H. WILLIAMS.
P.S.—I correct the error with respect to the copy of contract being resented at the Court of Sabará on behalf of Mr. Williams. This is not the fact.

ST. JOHN DEL REY MINING COMPANY.

SIR.—Mr. Gordon's letter, in last week's Journal, complaining of my having stated he would be present at the meeting of shareholders I proposed to call for the purpose of determining the mode of procedure at the general meeting to be held on the 12th inst., has occasioned me considerable surprise and astonishment. I supposed Mr. Gordon was acting cordially and in unison with me in organising the opposition to the board's proposals, which has resulted in the appointment at the general meeting of a committee to enquire into the management of the mine and the company's financial condition; and therefore, as he had pledged himself to attend that preliminary meeting, if his engagements would permit, and the holding of it was postponed until the latest possible moment in order to suit Mr. Gordon's convenience, I do not see that I committed any impropriety in mentioning the fact that he would be present at the meeting; and when I state that he did attend the meeting, and cordially acquiesced in its proceedings, I am at a loss to account for the motives which actuated him in writing the letter I complain of. Mr. Gordon I fear is one of those who is willing to wound, and yet afraid to strike. I do not want the assistance of such allies. I can only act with those who, like myself, will come to the front and display the courage of their opinions, and not with men who sink into the background at a critical period of the contest.

The appointment of the committee of consultation, or enquiry, is the thin end of the wedge, which, for the first time, has pierced the armour of autocratic exclusiveness, arrogant dictation, and contempt of advice and remonstrance, in which the board has hitherto enveloped itself, and the shareholders have to thank me for it, as I originated the agitation, and organised it almost unaided, and entirely at my own expense. It now remains for the committee—the members of which have yet to be selected—to do their duty. I do not wish to act upon it, as my business engagements daily at the Stock Exchange and the additional claims on my time, which my connection with the management of other important companies involve, positively preclude my undertaking any additional duties. If the committee do their duty fearlessly and without favour or affection, I believe their labours will disclose such an amount of incompetence, negligence, inefficiency, and incapacity, combined with an utter absence of economy and foresight in the management of the mines, as well as incapacity on the part of the board to initiate and carry out its financial operations with prudence and success in a time of trial and difficulty, that an entire change of the management in Brazil will be found necessary, and a considerable change in the personnel of the present board will be inevitable.

Until I raised my voice at the meetings of the company in opposition to the board's policy and the management generally, the shareholders used to listen to Mr. Hockin's written speeches as though they were schoolboys at a lecture, and like schoolboys they dared not to question any of the statements, but gladly scampered out of the presence of the board, and in such hot haste as to suggest the idea that, like schoolboys, they had narrowly escaped a deserved birching. Now, however, all is changed, and the directors have found an amount of opposition, if not determined hostility, has taken root amongst the shareholders, which if it previously existed certainly has not been displayed at any meeting during the past 20 years. I may add, in conclusion, that the productiveness of the Morro Velho Mine both in quantity and quality of the mineral is not only steadily increasing, but will continue to increase, and that with ample machinery to draw the mineral to surface, and to keep the mine continuously drained to the bottom, combined with the energetic and continued sinking of the shaft, the days of remunerative, if not large, profits will shortly return, and are, in fact, nearer at hand than from the directors' discouraging report might be inferred.—St. Stephen's Chambers, Dec. 14. JOHN SCHOFIELD.

GUINEA COAST GOLD MINING COMPANY—TO FIND JOHN'S SHAFT.

SIR.—In the Mining Journal of Nov. 10, under the heading Foreign Mines, there is an extract from an official circular, sent to the shareholders of the above company, of which the following is the commencement:—"The lode in the end going north of John's shaft was never so good as at present." * * * And as I had no recollection of John's shaft having been previously referred to by the directors, I not unnaturally became desirous of knowing upon which part of our property this new-born infant is situated, and when the christening took place, more particularly as I was told by a brother shareholder that it is not on the original concession acquired by our company; and I, therefore, addressed an enquiry to our secretary, but little thinking it would be as difficult a matter to give me the information as it appears to be, judging by the two letters I have had from the secretary—the first an acknowledgment of my letter, stating that it would be placed before the directors at their next meeting, and the second was as follows:—"Your letter of the 26th ult. has been considered by my board, and in reply I am directed to inform you that, although desirous to afford every information to enquiring shareholders, the directors cannot undertake to carry on correspondence with individual enquiries. The fullest particulars for which you ask will be given in the usual manner in the report of the directors, to be presented to the shareholders at the next general meeting."

As the next meeting will not be held for about three months will you, Mr. Editor, be kind enough to assist me to find John's shaft by publishing this in your next issue, as possibly some of your readers with a knowledge of the Coast, may be able to do that which at present, at all events, it is evident our directors cannot do, as, I may fairly assume, they would if they could, or the secretary would not

have been instructed to write the above letter, as you will observe that he says the directors are desirous to afford every information to enquiring shareholders. AN ORIGINAL SHAREHOLDER.

Dec. 11.

AMERICAN MINES.

SIR.—Facts as regards the profitable nature of many of the mines now in operation in America will be hard to dispute, and in conjunction with the list of dividend mines in Australia I mentioned last week, may help to dispel the illusion that exists with so many that mining is unprofitable. To give a list of the various dividend mines in America would occupy too much of your space. I will, however, give a statement of dividends and assessments from a list of mines, taking only those that have paid in dividends 50,000*l.* and upwards. It will be seen from this small number of mines, as compared with the large number that are now and have been at work, and whose dividends are not easily attained or not yet reached the above figures, that American gold and silver mining is of a highly profitable nature, and deserving the attention of investors who are interested in legitimate mining.

From a list of 43 American dividend mines the total amount paid in dividends has been \$74,077,502, or (say) upwards of 14,000,000*l.* sterling. It is in well developed and well managed enterprises as above, and such others as are now in process of being classed in the list of dividend mines, that investors reap the reward of their faith in *bona fide* mining. There has been and always will be more money made out of honest legitimate mining than out of all the scheming ever perpetrated in the name of mining.

As an example of economical and profitable gold mining the mines at the Black Hills, Dakota, offer an excellent example; they have in a few years mined and milled 1,512,037 tons of gold ore, yielding \$10,434,116, being an average of only \$5.78 per ton, making a profit and paying in dividends \$3,142,500, the total assessments made being only \$400,000. I could enumerate many other instances of great success attending the operations of gold mining companies well managed and working low grade ores. I know of many where mining can be carried on with very handsome results on the outlay of a very moderate capital and the economical direction of labour; but in consequence of the extravagant waste of capital and the incompetence of those directing mining works, gold mining as conducted by companies in England has obtained a reputation that it does not deserve. There is no business where so much profit can be made as in well devised and legitimate gold and silver mining where the official business and mining works are conducted by men of experience. The vast production of gold and silver from the mines in America and Australia, and the enormous profits realised, should be an incentive for investors to give more attention to these countries as fields for enterprise and profitable investments.

THOMAS CORNISH, M.E.,

"Author of Our Gold Supply; its effects on Finance,"
"Trade Commerce and Industries," &c.

CANADIAN MINING, RAILWAY, AND GENERAL INTELLIGENCE.

SIR.—The North West of Canada is now the place which is engrossing the attention of all who are fond of roving. In the heart of the Anglo-Saxon there appears to be a desire to look around. Nowhere can anyone travel any where in the world without finding a Scotchman and a Yankee. Next comes a Canadian, and then an Englishman. The Union Jack is the chief flag in every port, and the English language is understood and spoken everywhere. But if this condition of things may be said to be nearly if not altogether correct, on this continent at least the people are wide awake to the advantage of getting in early into the North West.

The Canadian North West has many advantages as regards the quality of the land and the facility for obtaining it over the United States; but the United States has one great advantage over Canada. Her market is a market of 50,000,000 of people, continually increasing in number, and held entirely for the people of the United States. Their tariff is a wall against other nations. If the United States would open her markets to Canada we would soon embrace the Free Trade principle, but as she will not do so the Canadians as a matter of self defence were compelled to put on armour and create a national policy. The selfishness and idiotic passions of those who held the reins of Government in the United States at the time that Government gave us notice to abrogate the Reciprocity Treaty has had this effect. It put Canadians on their mettle, it was the chief cause of the formation of the confederacy, the Dominion of Canada, it was the cause of the building of the Inter-colonial Railway, the creation of the National policy, and the organisation of the Canadian Pacific Railway. Now Canada is sailing forward splendidly with full sheets before a spanking breeze, with her treasury full, surplus each year, with the country happy and prosperous. We may thank our American cousins for all this. If they had not abrogated the Reciprocity Treaty they might perhaps have coaxed us into closer union, but the moment they began to drive us we would not be driven, but cried out like Falstaff—"What, upon compulsion." The English tried to drive the colonies in 1776, and the result was the formation of the United States. The United States tried to punish Canada in 1864 for sympathising with secession, the result was the formation of the Dominion of Canada. I tell you this Anglo-Saxon blood cannot be driven, whether it is in England, or America, or Canada, or Australia, or Cape of Good Hope, or India, or Hong Kong, or anywhere.

With regard to land laws those of Canada are considerably more liberal than those of the United States, but it will suffice to give the subjoined comparison between the Homestead policy of Canada and the United States, to show which is most favourable to settlers—

CANADA.	THE UNITED STATES.
The head of a family or any male person not less than 18 years of age is entitled to a homestead entry.	Any male person not less than 21 years is entitled to a homestead entry.
Such entry may be for any quantity not exceeding 160 acres in any lands open therefor. The even-numbered sections on or about 80,000,000 of the most fertile lands being free for selection.	Such entry may be for any quantity not exceeding 80 acres in the first or \$2.50 class, or 160 acres in the second or \$1.25 class of lands open therefor.
Until the 1st January, 1885, the settler will have the right of pre-emption of an adjoining tract of the same extent as his homestead, which he can purchase at the end of three years at Government prices.	The homestead settler has not the right of pre-emption.
He obtains a patent at the end of three years' residence and cultivation. He may have a second homestead entry.	He obtains a patent at the end of five years' residence and cultivation. He cannot have a second homestead entry.
He may commute by purchase after one year's residence.	He may commute by purchase after one year's residence, but it is recommended that this privilege be modified and restricted.

Still there are a good many matters and things in connection with the Department of the Interior that require looking into. In the first place there should be a Minister in the Government that is acquainted with the North West, some person that has lived there who knows the ideas of the people and their wants. The present Minister of the Interior is the Hon. D. L. Macpherson. He is a fine old gentleman who has been Speaker of the Senate. Why he did not stay Speaker of the Senate, which was a post where his gentlemanly dignity and knowledge of legislative procedure made him serviceable to the country, and why Sir John A. Macdonald did not get some young active man for Minister of the Interior, God only knows. The people of the North West are different from the people of the rest of Canada. They are quicker, work harder, endure more, and above all things hate red tape and tom-foolery. They are 1500 miles away from Ontario, and further from the other provinces. They require particular attention on the part of the Government of Ottawa, and if the Ottawa people fool them and do not give them their rights, the fire will smoulder and smoulder till it bursts forth.

ALUMINIUM.—I notice in the Mining Journal of Nov. 10 a paper read by Mr. Walter Weldon before the Society of Chemical Industry, on the manufacture of aluminium. From this it appears that Mr. Webster's patent is not likely to amount to anything, as he cannot make the metal any cheaper, but can only begin to make it. We had expected great things from Mr. Webster's patent. We were

going to sheath our steamers that run the rapids with aluminium, and many other things we were going to do. But now, alas, we shall have to wait.

THE IRON INDUSTRY.—If any of your iron firms, good firms that can make steel rails, &c., have not work enough and have to stop, the best thing they could do would be to move over their whole plant and men, &c., to Canada. Here at Brockville on the Canadian Pacific Railway, no better place could be found for establishing a large furnace. About 40 miles out on the line is a splendid hematite iron mine of 1000 acres. Brockville is on the St. Lawrence, and coal could be brought from Nova Scotia or from Pennsylvania. Then there is the bonus of \$1.50 a ton for all iron manufactured in Canada, and the demand of the Canadian Pacific Railway, which is all the time increasing. But the Englishmen will stick to England I suppose, and if Canadians want to establish iron furnaces they will have to do it themselves. They would have done it long ago I have no doubt, but they do not know anything about the manufacture of iron and steel rails for one thing, and they have not capital enough for another thing.

I suppose you thought I was dead as you have not heard from me for so long, but this letter will convince you to the contrary.
Brockville, Nov. 26. BOURNITE.

THE MINING INDUSTRIES OF THE UNITED STATES FOR 1882.

SIR,—Colorado takes the lead in the production of the precious metals. A very interesting report on the mining industries of the United States for 1882 has recently been published under the direction of the Geological Survey at Washington, from which I learn that the total value of the metallic and non-metallic products for that year amounted in the aggregate to \$445,912,406, distributed as follows:—Pig-iron, \$106,336,429; silver, \$46,800,000; gold, \$32,500,000; copper, \$16,038,091; lead, \$12,624,550; zinc, \$3,646,620; quicksilver, \$1,487,537; nickel, \$309,777; coal, \$146,632,581; crude petroleum, \$23,704,698; lime, \$21,700,000; building stone, \$21,000,000; salt, \$4,320,140; cement, \$3,672,750; limestone for iron flux, \$2,310,000; phosphate rock, \$1,147,830; miscellaneous, \$1,681,453; total, \$445,912,406.

The productions of coal and iron were principally furnished by Pennsylvania. The former representing 63 per cent., and the latter 50 per cent. of the grand total. The combined product of gold, silver, and lead, is valued at \$92,000,000, of which Colorado takes the lead, furnishing 28 per cent., California coming next with 19 per cent. of the total productions for the year.

With the exception of petroleum and copper, the former being chiefly produced in Pennsylvania, and the latter in the Lake Superior district; the remaining productions are well distributed over the various States. Taking the precious metals into consideration it will be readily seen that Colorado, although the youngest State in the Union, stands foremost in those productions, a position it has occupied for the past three years, and such as it is likely to hold for some time to come. It, therefore, follows that this State offers better inducements for the investment of capital in mining than any other portion of the country, and if people exercised the same care, it would not only become as legitimate as any other kind of business, but far more profitable to those who invest. J. FITZ BRIND.
Denver, Nov. 22.

KAPANGA GOLD COMPANY.

SIR,—As a shareholder in the Kapanga Company I was sorry to receive by this morning's post a circular from the directors, saying that, in consequence of the debentures not being applied for, they call a meeting for Thursday next, for the purpose of moving a resolution to wind up the company. I regret this very much, as I do not think the Kapanga Mine has had a fair chance. Instead of the expenses being kept down to 1500l. or 2000l. a month, the costs have run into more than 5000l. a month. At the late meeting the feeling of the shareholders was in favour of a new manager being appointed, and I am sorry this has not been done. I hope the shareholders will attend the meeting on Thursday next, and decide not to wind up, but to come to some arrangement for keeping possession of the property. If the money cannot be raised by means of debentures, why not increase the amount of share capital by, say, 50,0000l. or 60,0000l., and issue the shares at 2s. 6d. each, such shares being considered as having 17s. 6d. each credited thereon. I have no doubt the shareholders would take up such shares on these terms. Supposing this to be done, and 60000l. raised in this way, I would recommend the meeting to insist on the expenses being cut down to, say, 1000l. a month until larger returns can be made from the lodes.—Barnstaple, Dec. 13. A SHAREHOLDER.

CORPORATION OF SOUTH AUSTRALIAN COPPER MINES.

SIR,—The glowing accounts that appear weekly in your columns concerning the above-named undertaking ought surely to raise expectations of something tangible to follow. Two years and a half have passed since the shareholders sunk their money in this scheme, and as yet there is no hint of a return in the shape of a dividend. Possibly the management are satisfied with their share, as the working pays expenses and directors' fees, and so long as no one grumbles this may go on to the "crack of doom." To make matters worse, no efforts appear to be made to place the Corporation on a footing that will obtain them a Stock Exchange quotation. Certainly in your columns the shares are valued at 8s. 9d. to 11s. 3d. per fully paid £1 share, or (say) ½ discount; but no one can consider this a satisfactory result after the flourish of trumpets used in floating the Corporation.
London, Dec. 12. INQUIRER.

VOLUNTAR LIQUIDATORS, AND QUARTZ HILL CONSOLIDATED GOLD MINING COMPANY.

SIR,—Mr. Dunhill's letter in last week's *Mining Journal* begs the entire question. If the liquidators did not take any advice as to the liability of the promoters, then the "more the pity;" but I have it upon good authority that the new board of directors, of which his colleague, Mr. Powell, was a member, took counsel's opinion as to the circumstances relating to the formation and promotion of the company, and were advised that certain parties were responsible. To persons of "ordinary intelligence," of which Mr. Dunhill apparently claims a monopoly, it is hardly necessary to remind them that a good many of the provisions of the Companies Acts are "technical;" but they are none the less salutary, and it cannot be too generally known that the duties devolving upon liquidators cannot be lightly ignored.
Queen Victoria-street, Dec. 13. E. BEALL.

COLLIERY EXPLOSIONS.

SIR,—The clear evidence adduced in Mr. Brown and Mr. Ellis Lever's intelligent and feeling articles which have recently appeared in the *Mining Journal*, as to one of the chief causes of colliery explosions, to anyone endowed with only ordinary intelligence is conclusive that the use of the Davy lamp is a prolific source of loss of life, and should therefore without a doubt be prohibited. Mr. Brown and Mr. Ellis Lever's well known abilities and long experience entitles them to a respectful hearing on this subject, and a deputation to the Home Secretary headed by these gentlemen would undoubtedly be the means of eliciting something from that gentleman of immeasurable benefit to the collier. In some things the reputation of the Home Secretary is not considered superfluous, but could the deputation persuade him to use only one-half of the zeal he does in matters not to be compared to this in importance, the collier would find in him a substantial friend. Mr. Ellis Lever has proved himself an unparalleled friend to the collier. The premium he has nobly offered—5000l. for the production of the safest instrument to light collieries—is not only an example to the Government, but a reproach, and for which he is worthy of the eternal gratitude of the collier. That such a state of things exists, as stated by Mr. Lever in his letter in the *Mining Journal* of Dec. 1, in reference to the investigation at the inquest over the unfortunate miners killed at Accorington, he writes—"Mr. Martin, one of the Inspectors of Mines, declared yesterday that the authorities when they saw the Davy lamps in use had no power to prohibit their use." To say the least about it is simply disgraceful and abominable, and to my mind

brings the Government in as the culpable party for the explosion, and all others from the same cause until they remove it. This may appear strong language, but the seriousness of the subject warrants the strongest language spoken in the English tongue to condemn the Davy lamps from future use, and the supineness of the Government in not before preventing the use of—as Mr. Ellis Lever truthfully terms it—"a fatal man-trap." There are other sources of danger to loss of life in the collieries than the Davy lamp, amongst which the use of gunpowder stands in the front rank. Those sources emanating from the colliers' own recklessness the Government are not responsible for, independent of which the responsibility which does rest upon them from the present mode of working the collieries is of the gravest nature possible, and surely the mute appeal of the widows and orphans, created by the terrible disasters which at this season of the year we almost dread taking up a paper in anticipation of reading the too oft-times repeated heading, "Awful colliery explosion and loss of life," is sufficient to move the heart of the Government without pressure for more efficient legislation in the working of the collieries.—Perranporth, Dec. 11. W. NINESS.

A DISCURSIVE VIEW IN THE INTEREST OF MINING—No. III.

SIR,—That the accumulations of metallic ores in their several receptacles is from a natural process of chemistry I have already in effect stated, and that they originally commingled with the ingredients of certain rocks, and were extracted therefrom by the solvent agency of water. On that well-founded assumption order is implied, and order presupposes law, and law again system. There is a relationship of veins and rocks reciprocally affecting or disaffecting each other. Changes are in progress doing and undoing, and again doing, a revolution of incessant change, so that it may be said motion is the vital principle of material, being both organic and inorganic, the only difference being, in my judgment, that individualities are more readily identifiable in the organic than in the inorganic system; but that the latter is as perfectly constitutionally systematised as the former I have not the least doubt of whatever. The apparent disorder and confusion of the rocks caused by eruptive and disruptive energy is as conformable with the operations of law, and is no greater or more embarrassing than atmospheric derangements during a violent thunderstorm, and both are—it may be presumed—produced by the same imponderable force but differently conditioned.

That the success of mining is largely affected by natural conditions, and by none more so than the character and condition of the rocks which the respective venous systems inhabit it becomes of paramount importance to study and know the significance of specific phenomena, and the relationship of one member of a venous system to another or other members of the same system and their probable or actual effect on each other, in conjunction with the class or order of rocks with which they are associated.

The auxiliary sciences being duly employed the dictates of practical experience became paramount in mining, and that has demonstrated in a large majority of instances that tranquillity is a prevailing characteristic of Nature's formative energies in the mineral world, and that the violent action of disruptive forces portends the breaking up of systems. The most productive, most profitable, and most enduring mines are in every way exempt—or, more properly speaking, have hitherto not been visited by the violent action of dynamic force. The historic mines of nations are so characterised. Whence then the fascination of spasmodic bubbles, fragments of systems, rent and torn and displaced, wrenched from their native repose and contiguity, but commanding from their abnormally elevated pomposity an attraction scornfully and strenuously resisted and ignored in respect of less pretensions, but much more valuable, worthier, and wealthier objects. Reason appears to be stifled and sense predominates, yet, as Mr. Robert Hunt has somewhere said, in his *Poetry of Science* I think, "The true is the beautiful," although frequently, as in mining, its garb is not the most attractive, but it eventually asserts itself, and its supremacy becomes established, its authority recognised, and its teachings accepted. Let us go back to it in the matter of mining. My object is to show, if possible, that the laws and operations of Nature, together with some of their manifold effects, are spread out before us and arranged to view in the mineral kingdom, and whether we flippantly ignore through conceited self-sufficiency, or disregard through culpable inattention, we do so to our own positive disadvantage, if not personal injury. But what has this to do with mining, it may be asked. I would reply as much as botany with the culture of plants. If, then, the formative order and economy of Nature are characterised by regularity of law and tranquillity of movement the staple sources and emporiums of metallic ores must be conditioned and harmonised, and such almost universal practical experience has found and demonstrated. If in accordance with this view the hidden treasures of the earth are hidden, as the terms imply, in accordance with the conditioned order of Nature and its laws, affinities, and functions chemically and mechanically in operation, together with the irrepressible active agencies, the uncontrollable imponderable forces irresistibly working to the accomplishment of definitely successive ends, we may, I think, confidently conclude that the mechanism and laboratory of metallic ores and metalliferous constructions are where the respective agencies are residential, and where the material, channels, and avenues exist for the upbuilding and working out of natural destinies preconceived and predestined of structural forms usefully adapted—their subsequent demolition, dissolution, transposition, transportation, and reconstruction, aggregate and complete, of newly combined and newly associated elemental constituents, originally extracted in intangible molecular condition from their secluded embryonic recesses in the hidden rocks, by the peaceful passage of percolating waters, and thence borne in their embrace through trackless labyrinthine avenues to natural chemical laboratories there to undergo literal transformation, and eventually to mingle with the light of day, minister to the wants, conveniences, and purposes of animated sentient and intellectual life and progress. The bosom of the water rock—to use a figure—is unquestionably the arena, the workshop or playground of the respective agencies and the medium of channels conditioned to their condition, and the results continually progressing unto the climax of perfectability of physical law the acme of such material existence and being is attained. That such is the *modus operandi* in the mineral realm of "the great globe which we"—and it—"inhabit," the principal repositories of metalliferous minerals may be reasonably expected to be found in those areas where the elemental conditions abound and where uninterrupted the pristine order of rocks and veins, together with the arterial accompaniments are in all probability areas prolific of the ores of commerce. Noble or ignoble, precious or base, the avenues and arteries of such zones, belts or areas, as they may be termed, are in systematic order, whether organised or not, their channels uninterrupted, their functions unimpaired, and the accumulated treasures of naturally produced accumulations of invaluable metalliferous minerals indispensable to civilised advancement and the necessities incident to that State are more or less abounding. It is here that the inarticulate voice of Nature may be heard, if not aurally, yet with a force equivalent to human utterance or sonorous sound, and which intelligent observers recognise and appreciate as the voice of natural harmony appealing in silent but impressive accents to reason, and the intellectual embodiment of the human understanding. It is here, too, that fact reasserts dominion over fancy, which too frequently supplanted it, and gives back to reason her recently invaded and usurped rights, and in so far adjusts and restores the equilibrium of objective truth to subjective reason. At first sight it may appear that the views here enunciated are more fanciful than real, more plausible than practical, and that their abstruseness ill adapts them to experimental application. It is not so, however, as almost all practical testimony acknowledges and endorses the well-founded assumptions herewith enunciated, if not in manner formally direct in matter most unequivocally formal indirect. Thus in descriptive and elucidatory mining reference is almost universally had to the congeniality or otherwise of strata or other containing rocks to the existence and vicinity of cross-courses—so called—which sometimes do not cross, but are themselves displaced, in mining parlance, and crossed by the ore-bearing lodes, to slides, dykes, their composition and general character and relative situations to the primal objects. If there were not a recognised

relationship between such phenomena and the prolific character and value of metalliferous lodes consequent on such associations, such references in the terms employed would be not only unmeaning and absurd, but flagrantly and inexcusably misleading. It is not a novel or new doctrine which is here contended for, but the giving of prominence, if possible, to an important but obscurely recognised theory, which, though generally vaguely acknowledged, is not at all appraised at its true significance and practical utility; otherwise the prejudice now existing in opposition to well selected virgin or juvenile mining properties would not be as prominent and pronounced as it evidently appears to be. But the bulwarks of that hideous monstrosity appear at length to be dissipating before the march of intellectual advancement, caroled in the light of reason and rooted in the groundwork of stubborn facts. Financial experience, too, if it could be induced to verify, expostulate, or speak of the sum of its adventures would be unmistakably led to testify in favour of well selected juvenile mining properties as the safest and best speculative investments, the substantial and most enduring sources of ample and satisfactory profits. It may be difficult—nay, impossible—to establish conviction in the minds of those whom it most concerns, although a dispassionate survey of the proofs *pro* and *con* would undoubtedly suffice to demonstrate affirmatively the position here contended for—to sum up in a single sentence—the proper prosecution of mining on its merits. R. KNAPP.
Tone, Nye County, Nov. 16.

GOLD AMALGAMATION.

SIR,—In last week's *Journal* Mr. Moon has an interesting letter on this subject, which requires a little explanation from him. I should like to know which are the sulphates most frequently found in the auriferous ores he has had to treat in his amalgamator. The sulphates of iron best known to me are melanterite and botryogen, and the sulphates of copper are chalcantite and brochantite, and not one of which, as far as I know, is of the least trouble in the amalgamation of gold.

To deal efficiently with sulphides, arsenides, tellurides, bismuthides, &c., is, as everybody of the gold persuasion knows, not a very easy operation. If Mr. Moon, by a slip of his pen, has written sulphates for sulphides, it scarcely strengthens his assertion, for most metallurgists believe, more or less confidently, that sulphides and other common associates of gold frequently hold it in various states of combination in an immature state; and, consequently, not being actual metal, there can be no amalgamation of gold in such states with quicksilver.—London, Dec. 13. T. A. READWIN, F.G.S.

LEAD MINING IN THE LAKE DISTRICT.

SIR,—Having for many years been interested in lead mining in Cumberland, and having heard that some of the most important lead mines in the county have lately been acquired by influential capitalists, principally from Liverpool I wended my way to Braithwaite, near Keswick, one day last week. I soon found that my information was strictly correct, as the little village of Braithwaite is once more all alive with miners. The mines I refer to are—the Brandle, the Barrow, and the Yewthwaite Mines. The Brandle Mine has been unworked for over 20 years. I know it well, and am in a position to state that the lucky owners have got hold of one of the most valuable mines in the kingdom. There is to my knowledge a rib of solid lead ore in the bottom of the mine over 2 ft. in thickness for a great length, and no doubt need for one moment be entertained but that soon after the water is pumped out of the mine large returns of lead ore can be made. I am pleased to find that the management of the mine is in efficient hands, that is just what is needed in this district; the mines are proverbially rich, but have only been played with in times past. I am informed that there is now ample capital provided, and that very powerful machinery of the most modern and improved kind have been purchased, the surface excavations and buildings to receive the machinery are in a forward state, and a few weeks will see the pumping-engine at work and the mine soon drained to the bottom, when a large output of rich ore is certain to follow.

The starting of the pumping-engine at Brandle Mine is looked forward to as a great event in the neighbourhood, and the miners who for years past have had to seek employment away from home are now happy at the prospect of permanent employment at home once more. I heartily wish the Brandle Mining Company the success which I am certain they will have under judicious management. At the Barrow Mine the works are in a more forward state—i.e., so far as the erection of the machinery is concerned. Operations I am informed were commenced some months earlier than at the Brandle. I found a good Robey engine erected on the Barrow property, with good and substantial pit-head-gear and other buildings, also a fine new engine-shaft, sunk to a depth of about 15 fms. This work is being done on a portion of the property known locally as Barrow Bottom. The vein is a very large one, and has been immensely rich in the mountains on both sides of the present shaft. The Barrow Company are now making a trial, if trial it can be called, below the level of the valley, and it is proposed to intersect the vein at 20 fms. deep. I should say it is almost certain to be found rich, as the old miners without machinery sunk small shafts here and there in the valley, nowhere exceeding 5 fms. deep, and got splendid lead, but they were unable to follow it down on account of the water. It is recorded in ancient writings on mines and mining in the Lake District that a solid body of lead ore, 2 ft. thick, was left by the old miners in one of these small shafts at a place called Uziccar; this is close to the spot where the Barrow Company are sinking their new engine-shaft; this coupled with the fact that the same vein has been so rich in the mountains to the north and south—in the old Barrow Mine, and also in the Yewthwaite Mine, places the success of the Barrow Valley trial, in my opinion, as a certainty.

I also went over the Yewthwaite Mine sett, which I hear is about to be reworked. This, too, is well known to be a rich mine; it has been very productive in the adit levels in the mountain, and gave large profits. What is wanted here is a good engine for pumping and winding, and to sink the mine to deeper levels. There are rich courses of both lead and blende in sight to operate on at any time the company choose to commence working. SKIDDAW.
Dec. 10.

NANT-Y-GLO AND BLAINA COMPANY.

SIR,—In your weekly market list of shares you continue to quote the shares of the Nant-y-Glo and Blaina Ironworks Company at the nominal value of 1000l.; but the nominal value of these shares has been legally reduced to 62½ 10s. each. In drawing your attention to this error, which, after all, may not be of much consequence, I would also venture at the same time, if you will permit me space, to call the attention of investors to the Nant-y-Glo and Blaina Company as being an investment of the soundest kind. The dividend return on the present prices of the shares is at the rate of 5 per cent. per annum, which, now that the company's affairs have been put on a more satisfactory basis, will continue to increase year by year. It should be borne in mind that the company is comparatively free from risks of trade, since it is not now engaged in making iron, or in any manufacture entailing such risks, but is, in fact, simply in the position of landlord, subletting its valuable coal fields and other properties to private firms, who pay royalties and rents to the company, and from these reliable sources the dividends are paid.

Next year, owing to reduction in debenture interest and a certain increase in the output of coal, there is a sure prospect of a dividend at the rate of 6 per cent. per annum on the present quoted prices of the shares. As bearing on the quantity of coal still possessed by the company, I would give the following from the speech of the Chairman of the company, Mr. Hugh Mason, M.P., delivered to the shareholders at the meeting held on Nov. 22:—"You will see from the output of coal—and we give in the report the output for a series of years—that in the year 1883 up to the period at which the report is dated for the first time we get upwards of 1,000,000 tons. I think I may venture to say that we are not going to stop at 1,000,000 tons, and you know that in proportion to the quantity of coal got out of our mines will be the amount of royalties we shall receive, and the amount of dividend we shall be enabled to pay our share-

holders. I hope no gentleman present will imagine that we shall exhaust our great coal field by increasing our output. I am enabled to say, on the testimony of one of the cleverest and best informed mining engineers in the country who knows this property well, that there is at this moment in our coal fields ungoten coal, of our best seams, the large quantity of 52,000,000 tons."

The Chairman also stated that there were estimated to be millions of tons of a second quality of coal, which was very good for the purpose of coke-making, and for the purpose of general steam use. Keeping these facts in view, and having regard to the present position of the company, with a conscientious and energetic Chairman at its head, it can hardly be doubted that there are few investments in Limited companies of a more desirable character.

Manchester, Dec. 11.

E. FARRAR.

SLATE, AND SLATE QUARRYING.

SIR,—Having previously made a few remarks on slate quarrying on the open system, I shall now endeavour to note the same on the underground system. But before proceeding on this subject it may be advisable to observe that most all the Merionethshire slate quarries are worked on this theory, especially those of the Festiniog district. In the olden times, when these quarries were first commenced, they were all worked on the open system, but latterly they have been most all converted into underground quarries. However, inasmuch as my object is to observe this mode of working from a general point of view I shall, therefore, not confine myself to any particular locality. Slate veins, or rather beds, are generally quarried on this system when they are heavily overlaid by large masses of other or similar futile rocks, which could not be conveniently worked otherwise. So the equipollence in adopting this system is or should be determined by the two following chief and important points:—First, the cost of clearing the outcrop on the open system; and, second, the difference of produce and profit realised by working on these systems. This being the case, it is evidently difficult to fix any accurate calculations on account of innumerable variations and circumstances relative to the different strata. But, however, the poise of such an important matter cannot be fairly ascertained by the comparative costs of the two systems; consequently, it must be found in the aggregate of the costs and productions of the several systems.

As intimated in the previous article—that about seven-tenths of the slate vein or bed is generally destroyed and lost by working on the underground system, which may be here explained. This is due chiefly to the necessity of having to leave nearly half the rock as pillars to support the top roof, the other portion (two-tenths) is annihilated by opening, excavating freestides, and squaring pillar sides, &c. This great loss and waste of slate is wholly evaded by working on the open system. Hence ariseth the essential and apparent propriety of considering the produce in conjunction with the general cost of developing and working on these several systems. There is, however, a great difference in some quarries or veins as to the quantity of rock necessary to leave as pillars. This should be regulated by the following circumstances as the case may be:—1. By the thickness of the vein. When the slate bed or vein is thin it is thus admissible to be worked with much narrower pillars, inasmuch as a narrow pillar of a small depth will bear more pressure than a much wider one of a greater depth. Therefore, the thickness of the pillars should always be determined by the thickness of the stratum. —2. The thickness of the pillars is also regulated by the compact or incompactness of the rock, as each of which has something to do with their size; for instance, where the rock is of a loose and jointy formation it demands the pillars to be much wider on that account, as it has not the power to bear a great pressure like that of a compact rock. The widths of the chambers are determined also by the nature of the roofs under which they are worked. When the immediate roof is a strong substantial hard layer then the chambers can be opened to a good width. But, on the other hand, when the roofs consist of brittle bands or layers and present any perspicuous symptoms of frailty, it is always advisable to open under such places with the utmost caution. Practice and experience are the only safe guides under such circumstances.

I will here suggest the following widths of chambers and thickness of pillars for the quarrying of two slate veins—say, one 20 and the other 40 yards thick:—

1.—A slate vein 20 yards thick, and possessing a good substantial roof, consisting of good strong hard, will safely admit its working in chambers of 30 yards wide and pillars of 10 yards. When the angle of the slate is very great the width of the chambers may be increased by one-tenth its entire width.

2.—A slate vein 40 yards thick, having a strong hard band for its roof, is capable of being worked in chambers similar to those of a narrow vein—30 to 40 yards wide—according to the angle or strike of the slate and the stability of the roof; and, further, it is imperatively essential to increase the size of the pillars in quarrying thick veins, in consistence with their respective bulk.

It, therefore, becomes necessary to allow a width of from 14 to 15 yards to the ordinary pillars in such veins. The necessity for increasing the size of the pillars is amply obvious from the fact that it requires a stronger pillar for a great depth than it does for a shallow one. This necessity, however, ariseth chiefly from the frequent occurrence of bevel, slant, back, slip, and other such joints that so often present themselves in slate, and which greatly tend to weaken the pillars. But notwithstanding these natural weakening causes in the pillars great care should be taken not to weaken them further by a careless way of working the chambers. It is very often the case that they are partly and nearly wholly eaten away by working the chambers in a heedless manner, and thus resulting at last in the crashing together of the whole concern, and thereby endangering many precious lives as well as damaging the whole concern. Consequently, no one never ought to grudge an adequate pillar; and those who, according to their iniquitous and frugal inclinations, have attempted to utilise these important and essential walls for slate-making, have through such injudicious and parsimoniousness brought and will bring themselves to considerable grief and disappointment, if carried on to too great an extent, like the man that killed the goose that laid him the golden eggs. For by killing the goose, for the purpose of extracting the desirable eggs all at once, only resulted in ceasing their production altogether. The axiomy of this old fable literally coincides and illustrates most eminently the curious and pernicious modes frequently exercised in the operations of subterranean slate quarrying; and it is only by a careful supervision they may be successfully avoided. The specific gravity of slate, as it is well known, is very great, being the greatest of all rocks excepting basalt; and is, therefore, from its compact and tenacious character capable of resisting an enormous intensity of pressure. The maximum density is about 179 lbs. to the cubic foot, and it is found that it will take on the average a weight of 90 tons to crush one cubic inch. So, from the foregoing, it may be easily inferred that when the slate beds are free from dangerous loose joints that the pillars may be somewhat modified accordingly. Slides, generally called bevels, are the most effective to weaken the pillars. The importance of working the chambers aright and seeing to the proper preservation of the pillars are matters that should demand the greatest attention.

It sometimes occurs that quarries are worked under the beds of rivers, so when such is the case particular care should always by all means be taken not to weaken too much on the ground under such circumstances, especially in the immediate vicinity of such a dangerous foe, because by so doing would inevitably jeopardise the whole property, and thus tend to enlist a jeopardous auxetic auxiliary to the general existing perils usually associated with subterranean slate quarrying. Few of course are reckless enough to undermine under such places, but an exceptional case may be found, and when it occurs the consequence of such an action is a certain doom of destruction, the result being only a question of time, especially if the quarry happen to be under the plane of the country. When a chamber is started in its proper width care should be taken to keep it so throughout its whole extent of working, and should not by any means be allowed to work into the pillars for the preceding and subsequent general reasons. The line of pillarage should be carefully taken and followed through the whole extent of the workings from floor to floor. If this is properly seen to the pernicious effects resulting from the prevalent random vogue of under-

ground quarrying may be safely avoided. So I shall here just note the general starting point of error. This generally originates in the miner's chamber operations; here the miner is set to work either to sink or to roof, sometimes both, for the commencement of a chamber bargain. And so it should be very carefully seen to that his roofing and sinking are in coincidence with the true line of pillarage. The pillarage is the proper line delineated by Nature for the rockman to follow, by which he must be invariably guided in order to work the slate naturally and economically; but it often occurs that he is forced to deviate from this course through the misguidance of his predecessor—the miner. When this is the case he has to force his bargain to such an extent into the proper jurisdiction of the pillar that they may be fairly considered to have entirely exchanged places. Hence ariseth the great importance of following the true line of pillarage, because by working thus athwart to the natural cross cleavage incurs a considerable more labour and expense, and, what is more than all, it destroys an immense quantity of valuable rock. An error of only a single degree on a single floor throws the bargain out of its true line by 27.8593 in., and it naturally follows that such errors continually increase in proportion to the angles of error. It has been observed that the angles of errors have been as much as 10° and often 20°, so the consequences can easily be imagined from their magnitudes, though frequently greatly ignored. Notwithstanding, however, the consequences of erroneous modes of working the chief point is to ensure and adopt the proper and right ways; consequently, as it has been observed above, the first right step conducive towards that is to give the miner his due and proper course, and if that is carefully followed it gives an infallible direction for the course of the rockman or bargain-worker, seeing that the latter must inevitably and of necessity follow the course of his predecessor—the miner. After securing this paramount and essential line for the rockman he will, of necessity, always maintain it throughout the whole bargain. But, nevertheless, he is still liable to err in another way, which is equally as damaging, and so it becomes as necessary to direct him aright in the execution of his duties as it is that of the miner. The workman is always very prone to cut into the pillars sideways as he goes along with his bargain, and, therefore, he thus narrows and weakens the pillars considerably, and if allowed to be worked for a considerable distance in this way it will finally result at last in cutting them right through—then down comes the quarry all of a crash. Seeing then that all such working against the natural cleavage and pillarage is both dangerous to the men and destructive to the slate, therefore, it should be avoided by all possible means. The adoption of a universal and unvaried fundamental rule would serve to counteract effectually all tendencies to these pernicious practices. So to achieve this end, and to carry it out systematically, it would be necessary to assume or fix a line coincident with the longitudinal direction of the pillarage; this would regulate the pillar and chamber sides in the first stage. Then from the same cardinal line another direction must be found, which must be either along the horizontal plane of the floor or taken from any point on the roof of the chamber to its base, and at right angles to the line of cleavage; this line again will serve the purpose to the quarrymen that the Polar star does to the mariner. Such guiding lines will always show at a glance whether the workers are going right or wrong, and thus ensure a proper system of working, having thus exchanged the old randoming, conjecturing, and bungling system for a canonical and candid systematic project. When any workings have been wrongly worked for any partial distance, especially roofing and sinking, it is of the utmost importance to arrest and adjust the same before proceeding too far by a trigonometrical system of lines, which will show at once the exact extent of error, as well as direct or suggest the best and most economical way of rectifying.

Blanan, Festiniog, Dec. 6.

THOMAS GILL JENKINS.

CATHEDRAL CONSOLS, IN THE CELEBRATED GWENNAP DISTRICT.

SIR,—The two reports, one being special, lately issued respecting this mine, ought to be carefully perused because they refer to some very important points, the chief ones being the rich bunch of ore gone down in the bottom of the 60, and now actually within a few feet of the 74 east; and also to the main object—the remarkably large lode which was seen by the former company many years ago, and to which a cross-cut will be driven in a few weeks. As the former managers, Capt. Jennings and Capt. Mitchell, looked forward to a great prize here we ought to be very thankful that we are progressing satisfactorily, and that the large engine can easily master its work.

In conclusion, it may be added that formerly good batches of tin were raised in several places in addition to copper ore, and that the stamps will soon be regularly at work.

Newton St. Cyres, Dec. 10.

A. S.

BETTWS-Y-COED MINES, AND THE PRICE OF LEAD.

SIR,—I have noticed the recent letters in the Journal on the Price of Minerals, Fair Trade, &c.; but without staying to discuss whether we should or should not be benefited by an import duty, I wish simply and emphatically to state that we in this locality are not ready to profit thereby, and if the price of lead went up to-morrow we are not prepared for any benefit it might bring, and I fear we are not alone in this respect. The order of the past was to work the ore wherever found (generally on the hill tops), and to follow it down till water or steam saved us the trouble of spending the money on extracting the ore. Lead ore is at present below the cost of production; but there is no evidence to show that our mines are less productive than in the past, or that we could not produce lead at a profit even at present rates if we possessed better appliances, but otherwise, and that we could as before compete with the world if we but put our works in order. We have at many points large reserves of lead in part opened to view; but we have neither opened our mines so as to obtain the ores economically or erected the necessary appliances for treating them profitably, with only one single exception, in which a spirited French proprietary are preparing to meet the requirements of the day.

At intervals during the past six years I have endeavoured to show that some of the mines in this district possess peculiar advantages of position, where they have the combined facilities of good roads, railway communication, ample water supply, and the means of deep level drainage, and amongst which the following have the most prominent positions along the outcrops of the ore-bearing measures from south-east to north-west, the general inclination of the strata being north-north-east:—

1.—The Griffin Mine (which is the lowest in the formation) to the south-east has yielded considerable quantities of massive galena from true fissure veins at the contact of the quartzite with the slate rock, and at the lowest point will produce 3 tons to the fathom.

2.—Coedmawr Pool Mine, sunk to a depth of 30 fms. chiefly in sandstone and gritty beds (overlying the more ponderous slaty beds), have produced from 8000 to 10,000 tons of lead, leaving rich ore along the bottom.

3.—Bettws-y-Coed Mine, about 20 fms. below adit in alternate grits and slates, has yielded large quantities of ore, and the lodes in the lowest levels are uniformly productive for upwards of $\frac{1}{2}$ mile in length, so much so that I have several applications from miners who offer to raise the ore and make it marketable at prices ranging from 40s. to 80s. per ton by the old tedious hand process.

4.—The Glyn Mine, N.W., where the lodes have been entirely worked out in the shallow levels for 300 fms. long, and in the lower levels, show profitable ore ground for the length driven—nearly 200 fms., and worth $\frac{1}{2}$ ton to the fathom in the forebrest.

All of those mines have been proved to contain lead in sufficient quantity to be profitably worked even at present prices, with proper appliances, and behind them in the heart of the mountain stands half a dozen other young mines on the same lodes, and presumably equally productive, but dependent on those named for the means of drainage and transit. Thus we have at home, and in small compass, what so many capitalists are sending their money to the equator and the Antipodes to obtain. But of what benefit will this mountain of treasure be to us if we do not adopt the means of extracting it at profitable rates? And let me ask the knowing ones what will either

Protection or Free Trade avail us in devising the means of bringing those mines into an efficient state of working and competition with those who have already set their houses in order against the return of normal prices?—*Bettws-y-Coed, Dec. 12.* CHAS. KNEEBONE.

MULBERRY TIN WORKS.

SIR,—I could not see any reply in last week's *Mining Journal* to "F. E. L., South Lambeth. As regards this company, it is in the Stannaries Court; but the Redruth Bank had a mortgage, and are carrying on the works—that is to say, the water stamps, the staff not being rich enough to pay for steam power. "F. E. L." being a shareholder should ask for his money to be refunded to him. Under the circumstances I think a mortgage ought not to be effected to pay the purchase by the vendor and promoter.

Dec. 13.

MINER.

EAST LONG RAKE LEAD MINE.

SIR,—My attention has been called to a question asked by a correspondent in your valuable Journal of Dec. 1 respecting the above mine. I beg to inform your correspondent that the mine is regularly at work, and with good prospects of success; but like almost all other lead mines, the prolonged depression in the lead market has seriously militated against it. The board of directors have wisely decided only to work on a limited scale until the price of lead advances; there are many points in the mine where lead can be raised if the price of lead was at its normal height, so as to make it worth while to do so.

Rhyl, Dec. 8.

H. B. VEROE, Engineer to the Company.

CALLINGTON DISTRICT, AND ITS MINES.

SIR,—It is with pleasure that I can speak of the improvement some of our neighbouring mines have shown recently. Prince of Wales is greatly improved at several points and it is now fully believed by all the mining experts of the district that the Prince of Wales is going to be the A 1 of the district ere long. I expect very soon to hear of a great improvement in Old Gannislake, as they are in daily expectation of cutting the Bonney lode. I visited Wheal Benny a few weeks since. I see they are getting on very well and the lode in the bottom of the shaft is large and producing some very good work for tin, and their water-wheel and machinery is working well, and their stamps will very soon be in full work.

It is very gratifying to find my former predictions with regard to Bickton Silver-lead and Copper Mine have been verified since I last visited the mine. The Bickton sett is undoubtedly as good a piece of mining ground as anyone could possibly wish to see. I visited the Trebartha Lemanne Mine on Monday last, and was pleased to see the tin turning out so well from the Gulley lode. I see they are now able to go with their first batch of tin to the smelting-house whenever they think proper.

Callington, Dec. 12.

JOHN BUCKINGHAM.

DEER PARK MINE.

SIR,—Within the last few days I had occasion to revisit the mining district in the neighbourhood of the Devon Great Consols, and was much struck with the work which is being energetically carried on at Wheal Benny on the banks of the Tamar. A large water-wheel had been erected and every effort was being made to develop this valuable property, which I believe will prove a great success.

Immediately adjoining this mine to the west is the Deer Park sett, through which run numerous lodes passing into the Wheal Benny property. Some few years ago mining operations to a limited extent were carried on at Deer Park, and some rich specimens of copper ore were discovered at the adit level in the north-east corner of the sett, many stones of good ore so raised being still to be seen at the mouth of the adit close to the river's bank. Its position as regards the strata of ground on the edge of the Kit Hill granite range, the high "backs" which the levels of the surface will give above the adit (in some places probably about 100 fathoms), together with the close proximity of the East Cornwall Minerals Railway and the numerous mines in the vicinity, point out Deer Park as a sett of peculiar promise deserving development, and I should be glad to learn that a company had been formed for the purpose of working the mine in the way it deserves.—*Redruth, Dec. 11.*

J. B. THOMAS.

REPORT FROM CORNWALL.

Dec. 13.—Our idea that tin may be regarded as having touched its lowest price seems generally in favour, and yet there may for the time be a still lower deep. If so, however, we anticipate it will be merely of a passing character. The tone of the market has, of course, been adversely affected by the gloomy rumours which have been circulated touching the depression of trade; why or wherefore save for speculative purposes it is hard to see. No recovery can now be looked for until the Christmas holidays are over, and trade has once more settled down from the inevitable disturbance which they cause.

A curious letter has been addressed to the Mayor of Exeter by a gentleman in America asking to be told where he can buy 100 lbs. of wolfram. The letter was read at the police-court, and appears to have been treated as a kind of joke. Neither the Bench nor any of the auditors could have understood the nature of the query, and, in fact, the existence of wolfram seems to have come upon them as a new light. Their ignorance, however, is pardonable compared with the "knowledge" of a writer in one of the local papers, who does know what wolfram is, but coolly remarks that it is "not found in Cornwall or Devon." Perhaps it may be worth the while of Capt. Bishop to communicate with the American, and secure a new customer for East Pool.

It is with very mixed feelings that we regard the proceedings at the Dolcoath account. Nothing could be more satisfactory than the state of the mine itself, and the position in which since the recent "run" it has been placed for returning large quantities of tin. That the lode in the 375 should be worth 120l. a fathom for 6 ft. wide, with a probability that it is nearer 36 ft. wide than 30 ft., and so worth some 700l. per running fathom, is a fact that may fairly be looked upon, having regard to the depth, as wholly unprecedented in the annals of Cornish mining. Strange that with such a mine it should have been a matter of doubt—and rightly—whether a dividend should be paid.

Strictly, there can hardly be two opinions that the resumption of dividends should have been postponed. Unquestionably, if the current working only had to be taken into account, it had been fairly earned; but then, on the other hand, there is the accumulation of debt to the bankers caused by Mr. Basset's exaction (about the payment of the interest on which Mr. Holden seems strangely thin-skinned), and there is the bill of Mr. Rogers in connection with the Mayne frauds, which ought to be met as soon as possible. The point was a difficult one, as the narrowness of the majority showed, and it would have been well if the majority of the adventurers had been able to exercise still further self-denial. But there seems to have been considerable pressure upon many of the smaller holders, not only in connection with Dolcoath, but in consequence of the general depression of mining; and, so far as they are concerned, the step adopted may be the lesser of two evils. The circumstances may fairly be claimed as exceptional, and really beyond the control of those who are responsible for the management of the concern. We must hope that no further mishap will occur, and that Capt. Josiah Thomas will be able in the next quarter to realise his most sanguine expectations, and keep raising the 50 tons a week, at any rate, for the next quarter.

Concerning the bill presented by Mr. Henry Rogers, in the absence of the report of the taxing-master, we are really in the dark; 1178l. does seem an enormous outlay to be incurred in bringing a rogue to justice; but we must bear in mind that for nearly the whole of this outlay Mayne is primarily responsible. It is another item added to the 12,000l. to which he helped himself. Had he really shown the compunction with which he was credited, and not fought against the irresistible, the Dolcoath adventurers would be at this moment 1000l. or so better off. So much for the sympathy wasted on this Christian. As to the rights or wrongs of the bill itself, which Mr. Rogers offered to reduce to the even money by knocking off 10

1782, while we are not at all disposed to question the liberality of that offer—having a little knowledge of what law charges are—we must hold that the meeting were right in treating it in a perfectly business way. Mr. Rogers's proposal was fair enough, and his references are unimpeachable, but where there is a straight business course it is always better in business matters to take it.

The dispute between Messrs. Henderson and Capt. Teague, jun., with regard to the use of steam for the purposes of ventilation surely is one that admits of easy settlement. Messrs. Henderson have, of course, a clear right to work borers by steam instead of by air, and that involves a right to discharge the steam in any way that may be found most efficient for that purpose. But, on the other hand, it is equally clear that Capt. Teague has acquired a right to the use of steam for ventilating purposes, and that, therefore, he has a claim to consideration in the case of any attempt to adapt the exhaust steam to the double duty. In the absence of adaptation the point should not arise.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Dec. 13.—The Coal Trade does not present any specially new features this week. All the collieries are now running steadily on about two-thirds to three-fourths time. The supply is in excess of the demand, stocks having accumulated during the recent unsettled state of affairs. Prices consequently favour buyers. Yet masters are rather chary of entering into long forward contracts at present rates, since it is felt that the wages question is not settled, but only postponed. There is an idea that early in the New Year the agitation for an advance will be renewed. Prices stand at 10s. as the Earl of Dudley's quotation for furnace coal, 8s. 6d. to 7s. 6d. for mill coal, and 7s. 3d. to 6s. 3d. for forge coal. Slack, alike rough and fine, may be had at very low rates. The pig-iron trade shows no recovery, buying being practically suspended until the New Year. Prices are easy. All-mines are 65s. to 60s., and cinder sorts 42s. 6d. to 39s. Part-mines (native) are 50s. to 45s., and foreign 45s. to 47s. 6d. delivered. Northampton ironstone is coming into this district in large quantities, but chiefly under old contracts. Prices vary from 5s. 9d. to 6s. 6d. delivered. For manufactured iron new orders are still curtailed. Best bars are 7l. 10s. to 7l., and common 6l. 5s. to 6l. Sheets are 11l. now for best (thin) sorts, and 7l. 15s. for galvanising sorts. The manufacture of bars, sheets, and light plates in all classes of steel has now been taken up by the Cookley Iron Company (John Knight and Co.), Kidderminster. The ironworkers have given in a notice, which expires at the close of this month, that they shall require the Wages Board to early consider a revision in the present rate of payment, which is 7s. 6d. per ton for puddling.

The arbitrators under the South Staffordshire Drainage Acts have given notice that they have prepared a draft mines drainage award for the Old Hill district for the ensuing year, and that they will hold a public court in Wolverhampton on the 20th inst. to hear appeals from mineowners and occupiers. It is not likely, however, that there will be any serious objections since the document as now issued is almost an exact copy in its essentials of the final award of last year, and that award was generally received with satisfaction by all parties.

The North Staffordshire Institute of Mining Engineers had two papers read before them on Monday—one "On Sinking Through Quick- sand and the Minnie Pit at Podmore Hall Colliery," by Mr. R. Wilson, and the other "On the Haswell Mechanical Coal Getter," by Mr. W. F. Hall, of Durham. In the latter paper the new machine was fully described, the author being aided by diagrams, &c. He expressed the hope that the apparatus might take the place of gunpowder in coal mining. The Chairman (Mr. J. Lucas) said that both papers possessed much interest for the Institute, and at his suggestion they were ordered to be printed. Mr. Lucas added that in some seams the Mechanical Getter might be useful if it were not too cumbersome and heavy. Votes of thanks were accorded both authors.

On Wednesday an inquest was held at Silverdale touching the death of James Lawton, who was killed whilst at work in the Podmore Hall Colliery, of Mr. W. Y. Craig, M.P. Deceased had prepared a shot which misfired, and whilst he was afterwards examining it it exploded in his face, inflicting terrible injuries, from which he died. A verdict of "Accidental Death" was returned.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

Dec. 13.—Marked quietness has of late been the rule in the mining districts of Derbyshire, and there is every reason to believe that the major part of the miners are well satisfied with the change of front which took place as regards the strike movement. A good many of them have shown that they are not likely to be again drawn into the agitation net, and endeavour to force their employers to make concessions beyond their power. This is likely to be the case at Clay Cross, where there are several collieries owned by the well-known company that takes its name from that place, and of which Mr. Jackson, J.P., is the managing director. When the men delivered in their notices several of them who occupied houses belonging to the company in return received the usual notices to leave them. This was more than the men expected, and Mr. Jackson only withdrew the notices in consequence of a deputation waiting upon him with a request to that effect. The result of the strike movement, as it is termed, is, that if the mineowners only act together and show a bold front, instead of some of them giving way and making concessions, such as the state of trade will not admit of, they have nothing to fear from the action of agitators. It is true that a Conference of miners' delegates is to take place in Manchester on the 27th inst., when another attempt in all probability will be made to cause a general strike in the Midland districts as well as in Lancashire; but there is not much likelihood of its succeeding after the recent failure. Indeed the trade is not really brisk at the present time, notwithstanding the fact that a good many collieries in the West Riding have been standing for upwards of a week, owing to the pit lads striking for more wages, no doubt urged on by some of the miners who are always willing to be in a fray and would sooner play than work. But colliery owners and merchants it may be said, are prepared for a stoppage, and this has been shown by the state of the coal trade in London during November.

Contrary to expectation, the threatened strike of miners which was agreed upon in November did not materially affect the London coal trade during that month; prices certainly went up as regards consumers about 1s. per ton as compared with the previous two or three months. The demand, however, was considerably less than in October, merchants evidently having taken the precaution of purchasing early and extensively in anticipation of the trade being interrupted by the action of the miners. The principal argument of the leading spirit who fought hard for the men striking until the 15 per cent. demand was conceded was that the colliery-owners had the power of advancing the price of coal to a point that would allow of their giving what the men required, and who further stated that in November the pit prices went up 2s. to 3s. per ton. That there was no foundation for this statement is to be seen by the fact just stated, that the London prices only went up 1s. a ton beyond the previous rates in force, so that the colliery owners did not realise the advantages the men were told they had done. Admittedly several pits in Nottinghamshire, Derbyshire, and the West Riding were busier than usual in November than they had been previously, but this was principally owing to the heavy demands made upon them by the railway and gas companies for the purpose of stacking, so as to be prepared for anything that might take place, and these supplies were bound to be furnished according to contract. A good deal of gas coal is sent to London from several of the inland collieries, so that the actual quantity of that forwarded for household purposes must have been considerably less than it was in October.

The invasion of Scotch coal so long promised has not as yet taken place, the quantity sent last month having only reached about 2000 tons. It is, however, stated that a series of steamers will commence running with coal between the Forth and the Thames early in the New Year. The coal, it is stated, will be sold to consumers direct at from 4s. to 5s. per ton cheaper than is now charged. This, if carried out—and of this there is not much doubt—would bring down the price of inland coal as well as that sent by sea from the North of

England. It is, however, probable that it will also result in a considerable number of colliery owners selling direct to the Metropolitan consumers instead of to merchants and through agents as at present, and thus do away with the intermediate profit, which of late years has frequently been the only one. The merchants' monopoly, it may be said, applies principally to house coal; but of late a fair quantity of steam coal has been sent from pits in Nottinghamshire, Derbyshire, and the West Riding, and some contracts are now running as low as 17s. per ton delivered, which under any circumstances cannot leave a large margin of profit; but the railway borne coal cannot be put on to vessels lying in the Thames owing to the charge for lighterage, &c. The colliers, however, are now working well in anticipation of Christmas, for in the course of about a week a large portion of the coal traffic will have to be shunted for a time to make way for holiday passengers and a certain description of goods traffic peculiar to the season. During November, however, it may be said that considerable changes took place with respect to the tonnage of coal carried by the various railways. These will be seen from the undermentioned figures showing the tonnage that passed over the different lines during the last three months.

	Tons—Sept.	Tons—Oct.	Tons—Nov.
Midland	213,397	217,541	214,897
London and North Western	130,740	132,942	158,483
Great Western	82,978	110,380	88,908
Great Northern	89,757	121,584	95,776
Great Eastern	77,039	65,638	71,780
Other Lines	7,917	7,206	7,101
Total	601,828	655,291	637,035

It will be seen that the London and North-Western carried 25,000 tons more in November than October, taking upwards of 20,000 tons from Nottinghamshire, and a like quantity from South Wales. On the other hand, there was a decrease by the Great Western, Great Northern, and the Great Eastern, that more than counterbalanced it. These figures bear out what we have stated with respect to the London coal trade, which may be taken as a fair example of that prevailing throughout the country.

Trade in Sheffield is more than usually brisk in all departments, and some of the men are working almost night and day. The mills are running to their full extent with armour and other plates, sheets, and steel wire. The cutlery houses are also doing well, more especially in table knives, although the prices of the best kind are higher than they have been previously. In inferior qualities there is also more doing. In edge and other tools, as well as files, business has also become more active. In ordinary Bessemer and crucible steel the demand has increased for billets as well as for special qualities for castings, cutlery, and tools. Some good orders are in hand for springs, tyres, and axles, and a large contract has just been obtained by one house for railway wagons.

TRADE OF THE TYNE AND WEAR.

Dec. 13.—The new commercial treaty which is at present in course of negotiation between Spain and this country is attracting much attention here, as it is expected that it will greatly benefit this district. There is a very important trade between this district and Spain; a large quantity of iron ore is imported from Spain to the Tees and Tyne, and a large quantity of coke is also exported from this district to that country. At one period a large quantity of silver-lead was also imported into the Tyne from Spain, but the low prices which have prevailed lately for lead has considerably reduced the amount of this trade. At present lead has a tendency to rise, which may improve imports. The harbour at Bilbao is being improved, so as to afford accommodation for the largest steamer, and the railways in the vicinity are also being rapidly developed, and it appears to be probable that this port will become the most important for exports and imports on the Spanish coast. As yet there are no details known here respecting this important treaty, but it is certain that a provisional commercial treaty has been concluded between England and Spain. Severe weather during the past week has retarded to some extent the shipment of coal and other goods in these rivers; but there is now a better prospect, and all the collieries in the district are now guaranteed a full week's work during the present week. The demand for steam and gas coal continues strong, and also for nut and manufacturing kinds, while house coal has somewhat improved. Prices of all kinds of coal are well maintained, but there is no change in value to report. There is a good demand for coke for shipment, but there is certainly room for improvement in the inland demand for it.

The Iron Trade at Darlington generally is very dull at present, some important works remaining idle—the Skeme Works, those at Springfield, &c.; the forgeworks are, however, very busily engaged. The North-Eastern Railway Company have extensive works at Gateshead and Darlington, and there is much activity in all branches at both these important establishments. At Gateshead most of the repairs to locomotives are executed, and new engines are also built on a large scale. At Darlington there are extensive engine-works, and also works on an extensive scale for the building of carriages, wagons, and trucks of all kinds. These carriages, &c., have hitherto been constructed of wood, but the company are now commencing the construction of carriages, wagons, and trucks with steel frames; the framework of steel is lighter than wood frames, it is also stronger, and in the end it is expected to be cheaper. The steel at present used is soft steel, procured from Bolton, but should this system of manufacture be extended there is no doubt that the steel will be manufactured here, and the introduction of the system will have a considerable effect on the steel trade of the district.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS.—A general meeting of the members of this Institute was held in the Wood Memorial Hall, Newcastle, on Saturday, under the presidency of Mr. G. B. Forster. There was a large attendance of members and others who had been specially invited to attend the meeting, the main attraction being a paper by Mr. W. F. Hall, "On the Haswell Coal Getter, an invention for working coal without the aid of gunpowder or other explosives." We subjoin an abstract of the paper:—"This machine is for breaking down the coal after it has been holed and nicked on one side by means of a mechanical contrivance, which may be described as a combination of three of the most powerful mechanical appliances—the screw, the lever, and the wedge. A hole 3 in. in diameter is first drilled in the coal and the wedge, together with two pieces of steel, which it—the wedge—is intended to force asunder, are placed at the bottom of the hole. The two pieces of steel and the wedge are connected by means of bars to the outside of the hole and fixed to four levers, joined so as to form a rectangle in such a way that the rods that are attached to the pieces of steel are fixed to the angle of the system of levers the furthest from the face of the coal, and the rod attached to the wedge to the angle nearest the face, so that when a screw that is attached to the two other angles of the systems, is so worked as to draw these together the wedge is forced between the pieces of steel which, after a few turns become firmly secured to the coal, and keeps the machine firm in its place while the wedge is screwed home.

This description of the machine will explain the immense multiplication of force which it is possible to apply by this special combination of mechanical powers. The experiments that have been made have proved the power of the machine in bringing down the coal in longwall work, and also in pillar and stall, under any conditions found in the present systems of working coal. The time required to bring down 9 tons of coal in longwall, loose at one end, is from 10 to 20 minutes, and 5½ tons have been got from a bord fast at each side in 29 minutes, and other equally valuable results have been obtained. The coal in all cases is very large and in good marketable condition. The machine has also been tried to bring down "canches" of stone to make height, and this is very important. In our notice of this machine in last week's Journal we observed that if this could be accomplished it would prove of great advantage, as it gives the power in the great majority of cases to dispense entirely with the use of gunpowder in fiery mines. There is no doubt whatever that this ingenious machine will prove of very great advantage in the working of coal mines.

COAL EXPORTS FROM THE NORTH EASTERN PORTS.—We learn

from Brown's Export List that the exports from these ports in November last considerably exceeded the exports in November, 1882. The coal shipped to foreign ports from Newcastle were in November 104,147 tons in excess of the shipments in November, 1882, and shipped to British ports from Newcastle the excess above November last year amounted to 12,825 tons. The total quantities shipped from the North-Eastern ports in November last amounted to 1,317,449 tons, against 1,133,894 tons in November, 1882, an increase of 183,555 tons. The iron trade has been steadier this week, and, on the whole, a better feeling has prevailed, the impression is gaining ground that there will be no farther fall in prices; still, the trade is not in a satisfactory state, there is a gloomy feeling abroad, and the prospect of reduced work at the shipyards has a depressing effect. At Middlesbrough on Tuesday there was a good attendance on 'Change, but the market was flat, and pig-iron prices are weaker; makers' prices are 37s. 3d. No. 4 forge 35s. The iron changing hand is, however but small in quantity.

TRADE IN SOUTH WALES.

Dec. 13.—The amount of coal reported at the principal ports of South Wales in the month of November was as follows:—Cardiff, 605,267 tons foreign and 81,261 coastwise; Newport, 147,605 tons foreign and 81,958 coastwise; Swansea, 81,331 tons foreign and 58,224 coastwise; Llanelly, 3987 tons foreign and 7141 coastwise. At Cardiff the increase on the first 11 months of the year, compared with the same period of 1882, was 875,288 tons; Newport, 201,453; Swansea, 23,847. At Llanelly there was a falling off of 18,251 tons. The amount of patent fuel shipped at Swansea in the month of November was 34,947 tons, making 326,571 for the first 11 months of the year; Cardiff, 20,802 in the month of November, making 156,863 for the same period. The amount of coal shipped last week at Cardiff was 139,338 tons foreign and 20,732 coastwise; Newport, 33,505 tons foreign and 17,068 coastwise; Swansea, 24,362 tons foreign. Prices are well maintained at all the ports, Cardiff prices ranging from 10s. to 12s. 6d., according to quality and whether double or single-screened.

The amount of iron shipped at Newport in the month of November was 13,232 tons, making 191,485 for the 11 months; Cardiff (November), 9524 tons, making 94,703 for the same period; Swansea, 495, making 6054. The amount sent away last week from Newport was as follows:—Swan River, 1807 tons; New York, 1232; Buenos Ayres, 830; Cape Town, 800. Cardiff sent away in the aggregate 5152 tons. The arrivals of iron ore last week at Cardiff from Bilbao were 3016 tons, and 1007 from other places; Newport received 9820 tons from Bilbao, and 3800 from other places. Prices remain low, but, as the supply will probably fall off during the winter months, higher quotations may be looked for.

The Tin-Plate Trade for the district is very quiet, and prices a trifle lower. The works, however, are well supplied with orders. Good IC cokes are quoted at from 16s. to 16s. 6d. per box, while charcoal-made are from 18s. to 20s. Wasters may be had at about 15s. 9d.

Some progress is being made in the negotiations respecting a conciliation board in the iron trade. The coal trade sliding-scale has worked so smoothly that ironworkers are desirous of being paid on the same principle, if such a scheme can be accomplished. Masters are in favour of it, as it enables work to proceed even in the most depressed times.

REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

Dec. 13.—The prospect of a rise in the price of lead is very welcome at this mid-winter season, and although for my own part I do not look for any substantial rise before spring, any indications of an advance in price by that time will be sure to stimulate enterprise. Among the districts which have suffered by the depression which has prevailed so long may be mentioned the two Carnarvonshire, north near Llanrwst, and south on the point of Llyn. The copper industry of the county has also languished. Talking of copper mines, perhaps the following reference to the copper mine formerly worked near Llanberis, and made 80 years ago will be interesting to those of my readers who are still engaged in copper mining about Snowdon. Pursuing the path leading from the castle to the edge of the lake I came to a copper mine belonging to a company of gentlemen who reside at Macclesfield. The ore is in general very rich, being worth on an average from 20l. to 25l. a ton, whilst that of the Parys Mine is not often worth more than 15l. The work was commenced in the year 1791, and the number of hands now employed is about a hundred. The ore is brought in small wagons to the mouth of the mine; here it is broken in small pieces with hammers. It is then soiled and the best and smallest pieces are taken out and conveyed in boats down the lakes, whence it is carted to the Menai, where a vessel is ready to cart it into Glamorganshire. This old-world glimpse of copper mining is very pleasant. What would our friends at Parys and Mona say if their ore—the same quality ore—was now worth 15l. a ton as it was at the beginning of the century. It is pleasant to note the good spirit that prevailed at the recent meeting of the Mona Company, and we cannot but wish the proprietors success as to means and results for and with the new developments they propose.

Considerable dissatisfaction is felt and expressed in North Wales at the recent reduction made in the price of slates. Mr. Dunlop, who was Chairman at one of the meetings, and who is the manager of the largest quarries in Festiniog, writes to complain that since the reduction, and notwithstanding the agreement already come to, the managers of the two largest quarries in Carnarvonshire have of themselves made a further reduction of 10 per cent. Consequent upon these reductions notices have been issued to the men in the Festiniog quarries for the reduction in wages of 10 per cent., and a strike among the quarrymen is imminent. In Carnarthen and Pembroke there is a little sign of life among the quarries. An influential local company has been formed to work the Whitland Abbey Quarry, whose green slates are well known in the Metropolis, and it is said that arrangements are being made to work the blue slates of Clyngwyn Quarry on a more extensive scale. Several hundred men are at work on the Whitland and Cardigan Extension Railway, and it is hoped that this line will be finished in the spring of 1885.

The North Wales colliers have withdrawn their second notices, and the relations between the masters and the men are satisfactory. In the Mersey Tunnel last week 31 yards were driven on the Birkenhead side and 7 yards by hand on the Liverpool side, leaving 194 yards still to be driven.

Notwithstanding the depression in several branches of industry it is satisfactory to notice that the traffic receipts of the Cambrian railways are increasing.

SOCIETY OF ENGINEERS.—At the annual general meeting on Monday the elections as council and officers for the ensuing year were:—As President, Mr. Arthur Rigg; as Vice-Presidents, Messrs. F. E. Duckham, Charles Gandon, and Perry F. Nursey; as ordinary members of council, Messrs. Robert Berridge, T. H. Hovenden, A. F. Phillips, Henry Robinson, W. Schönheyder, John Waddington, A. T. Walmisley, and M. Ogle Tarbotton, the last-named gentleman being a new member of council; as honorary secretary and treasurer, Mr. Alfred Williams; and as auditor, Mr. Alfred Lass. The proceedings terminated by a general vote of thanks to the council and officers for 1883, which was duly acknowledged. The annual dinner of the society was held on Wednesday, when the Chairman (Mr. Jabez Church, C.E.) stated that the society was founded in 1854 as the junior to the Institute of Civil Engineers. It now numbers some 400 members, most of whom are civil engineers, the remainder being mechanical engineers. The society holds meetings, at which papers on engineering matters are read, and lectures are delivered for the instruction of the junior members of the profession. After the usual loyal and patriotic toasts, the Chairman, in proposing the toast of the evening, "Success to the Society of Engineers," remarked that the association might take to itself a certain meed of praise for what it had accomplished during the 30 years of its existence. In every part of the world both land and water bore marks of the hand of the engineer, who had done much for the advancement of civilisation by using the vast powers of Nature to satisfy the wants as well as to furnish the luxuries of mankind. Engineers, whether

civil, military, or mechanical, had reason to be proud of their profession, which had done so much for the common good and for the advantage of the world at large. He was glad to be able to say that the society was now in a better position than it ever had been in point of numbers and in point of financial matters. During the period of its existence it had done a great deal for the education of the junior members of the profession, and he trusted that it had a useful career before it in the future.

FOREIGN MINING AND METALLURGY.

Winter has at last made its appearance in Belgium, and Belgian coal-owners can no longer complain of having the elements against them. Under the influence of snow and ice the Belgian Coal Trade has acquired rather a firm tone, and sale of household coal has been carried on with renewed vigour. This state of affairs has fairly well sustained the Belgian coal markets as a whole. The imports of coal into Belgium in the first 10 months of this year amounted to 1,038,917 tons, as compared with 828,774 tons in the corresponding period of 1882. The total of 1,038,917 tons representing the imports of coal into Belgium to Oct. 31 this year was made up as follows:—German coal, 371,836 tons; English, 243,610 tons; French, 99,699 tons; Dutch, 323,539 tons; and miscellaneous, 233 tons. The imports of coke into Belgium to Oct. 31 this year were 27,514 tons and 12,820 tons. The imports of both coal and coke will be seen to have sensibly increased this year. The exports of coal from Belgium in the first 10 months of this year amounted to 3,585,338 tons, as compared with 3,455,375 tons in the corresponding period of 1882. In these totals the exports to France figured for 3,344,108 tons and 3,267,266 tons respectively. The exports of coke from Belgium to October 31 this year were 840,100 tons, as compared with 906,255 tons in the corresponding period of 1882. Coke has remained quoted in Belgium at 12s. per ton, but the markets have not shown much firmness at this price. The German coal trade has been well maintained, and if the winter should prove a rigorous one it is probable that a slight advance would be witnessed in quotations.

The condition of the Belgian Iron Trade has still experienced no material change, and a certain uneasiness is felt as regards the future. The slackening in business which usually characterises the dead season is this year more marked and striking than has been the case for a long time past, and several works are in a somewhat precarious condition in consequence of an almost absolute want of orders. There is not much encouragement, of course, to be found in this state of affairs, and Belgian ironmasters will welcome the spring, as it is tolerably certain to bring with it some revival in business. An adjudication of 600 trucks for the Belgian State Railways is definitely announced for December 19. It is feared that the keenness of the competition for this order will show how very much in want of employment many of the works unfortunately are at present. Some of the principal Belgian ironmasters have addressed a letter to the Belgian Minister of Public Works impressing upon him the desirability of giving out orders for iron sleepers for the Belgian State Railways. English pig has receded upon the Belgian markets to 27. 3s. 4d. per ton, but Charleroi casting pig has been supported at 27. 14s. 4d. to 27. 16s. per ton. Athus-Halanzy pig has continued to be quoted at 27. 4s. per ton; hard refining pig has made 27. 4s. per ton; ordinary pig, 27. per ton; and mixed pig 17. 16s. per ton. Iron has been weak upon the Belgian markets at 57. per ton, and the scale of 8s. per ton per number has been almost generally abandoned, No. 2 having made only 57. 6s. per ton. No. 1 plates have brought 67. 12s. per ton; No. 2, 77. 8s. per ton; and No. 3, 97. per ton.

The intelligence forthcoming from Paris is somewhat scanty. In the North of France the iron trade has become extremely quiet. The forgemasters have maintained merchants' iron at 67. 12s. to 67. 16s. per ton in the North of France, but the utmost which can be obtained at Paris in most of the transactions concluded is 67. 16s. per ton, showing that the dulness of business has left scarcely any margin for profit. We learn from Bilbao, with reference to the course of business in iron minerals at that port, that the current quotations for Camponel is 7s. per ton, and for Rubio 6s. 2d. to 6s. 6d. per ton. Feebleness is becoming more general in the German iron trade, and now prevails from Westphalia to Silesia, which had hitherto resisted somewhat better the downward course of prices. Orders have fallen off rather seriously, and on all sides there are complaints of want of employment. Quotations cannot well go lower upon the German markets, but they show, at the same time, a marked downward tendency. The production of pig is meanwhile well maintained in Germany, having amounted in October to 289,882 tons, as compared with 283,950 tons in October, 1882. The aggregate production for the first ten months of this year was 2,806,640 tons as compared with 2,610,438 tons in the corresponding period of 1882. An official return shows that in the first nine months of this year Germany exported locomotives to the aggregate weight of 9714 tons, as compared with 9176 tons in the corresponding period of 1882; other machinery was also exported to the extent of 57,269 tons, as compared with 52,912 tons. A Hanoverian house has obtained a contract at Cologne for eight passenger locomotives at 1760l. per engine, as well as for 10 goods engines at 1840l. per engine.

MINING IN THE ARGENTINE REPUBLIC.

The port of Rosario is the natural highway or key to and from the vast interior; the trade is, therefore, not wholly a local trade, as it now supplies most of the interior provinces with a very large portion of the imported merchandise which they consume, and which formerly used to be purchased from the Buenos Ayrean market, but is now to a great extent imported direct. The extension of railways into the interior, the continued inpour of immigration, combined with the peace the country has enjoyed, have placed Rosario on a footing of advancement and prosperity such as few cities of South American can boast of.

The Colonial Railway of Santa Fé was inaugurated on Sept. 10, 1882. The concession has been given by the Provincial Government to Mr. Casado, a native of Spain, one of the most enterprising residents of this city. Mr. Casado has formed a company to work the line, and is at present pushing its construction very rapidly forward. As it is intended that this railway shall pass through some of the richest wheat districts of the province, it should in the course of a short time give a good return. A very considerable quantity of railway iron for this line is now on its way from England, and a considerable quantity of rolling stock, &c., has been ordered, partly from England and the United States. This will be the first railway which has been built in this province through local enterprise. Mr. Casado has an idea of erecting a mole near the terminus of the road, which is on the bank of the river, which, if carried out, will greatly facilitate the loading and discharging of vessels.

The exportation of minerals from the interior provinces and Bolivia has obtained very considerable importance. In the province of Cordoba alone there are from 16 to 19 mines; of these, however, there are only six actually worked. These mines principally consist of argentiferous ores, which vary from 60 to 500 marks of silver to the cajon of 5000 lbs., and from 30 to 70 per cent. lead. The principal mines are worked by two English companies—the Rara Fortuna Silver Mining Company, which work two, and Messrs Eddones and Co., who work three. The Rara Fortuna is the first English company that has imported and erected mining machinery in the province of Cordoba; they have now a 30-horse power pumping and winding engine, dressing-floors, crushers, &c., which is expected will give an output of 60 to 90 tons of ore monthly, varying from 100 to 300 ozs. per ton of silver. Messrs. Eddones and Co. have just finished putting up a pumping and winding engine in the Argentine Mine. This is the largest and most powerful lift yet erected in the country, for it is capable of pumping from 6000 to 7000 gallons of water per hour. The engine is of 40-horse power nominal, capable of working to 120-horse power effective, also, if necessary, of lifting three times the amount of water. This mine is considered the most important of the province, as, besides the silver, it carries from 3 to 4 ozs. of gold per ton. The other mines are at present only being prepared for work.

The great difficulty hitherto experienced in mining in this pro-

vince has been the disposal of the ore, through difficulty of transport; but now, owing to the new machinery for dressing and preparing the ore, there is no doubt in future there will be great impetus given to the working of these mines. The amount of silver ore and lead exported from these mines during the year is stated at about 80000l., but it will be greatly increased next year. It is impossible to obtain trustworthy statistics of the exportation of the minerals which pass in transit from Bolivia, and which form a very important item; but to show the enormous increase in the traffic with Bolivia by this route, I am able to state that no less than 65,000l. is the amount received during the year for transport of Bolivian merchandise by Argentine railways.

The province of Santa Fé has two cities and 57 colonies. The cities are Santa Fé, which is the capital of the province, and Rosario. The latter is, as I have before remarked, owing to its position, next to Buenos Ayres, the most important and commercial city in the Republic. It is comparatively a new city, as its commercial importance only dates back from the year 1856. Its population is at present reckoned at not less than 40,000 souls, of which a third part are foreigners, of which about 300 are British subjects. The city of Rosario has undergone many improvements during the past four years, the streets being paved and lighted by gas. The houses are of brick, mostly of one storey, but several very imposing edifices have been constructed, and many others are in course of construction. It is reckoned that no less than 150 new houses were added to the city during the year. As a proof of the extraordinary increase in the value of property, I may state that land which was sold in the year 1856 for 80l. is to-day valued at 2500l. The value of farming lands has increased in proportion. The Provincial Bank of Santa Fé, the National Bank, the London and River Plate Bank, and the English Bank of the River Plate have branches established in this city, all of which are doing an increasing and paying business.

BEHAVIOUR OF MINERAL WOOL AROUND STEAM PIPES.—In the Transactions of the American Society of Mechanical Engineers, Mr. F. R. Hutton states that a 5-in. steam pipe, containing steam of 40 lbs. pressure per square inch, was coated with mineral wool or slag wool, enclosed in a casing of galvanised iron. On uncovering the pipe it was found to have suffered rapid corrosion, and could be removed in flakes. It was observed that where the wool was entirely dry the pipes were in as good condition as when new; but where moisture was present and had permeated the wool the surface of the pipe was corroded. In general composition slag wool is a compound of silica with bases, usually lime, magnesia, and other matters. The element sulphur is not at all unusual in slags. It may be present combined in a sulphide, or in a hyposulphite, probably with lime as a base. In either case, by moisture and heat, sulphur would be released as an

oxidising agent, which would be only too likely to fasten on the iron. The presence of sulphur in solutions of scale taken from the pipe has been unmistakably proved, and this appears to show that corrosion must have been more active than that due to an innocuous conductor. Prof. Eggleston, in a discussion on the paper, insisted that wherever blast-furnace wool is to be employed, absolute freedom from moisture must be ensured. So long as the wool is kept dry, and not allowed to pack, there is probably, he says, no other substance that is as good for the purpose; but if it becomes packed it loses its non-conductive power; if it becomes moist it sags together, becomes packed, and is worthless; and if the moisture is at all constant there will, he concludes, be a decomposition of the slag, and an attack on the iron by sulphuric acid set free, or by organic acids if the material comes from the drainage of the soil.

—James Forrest's Inst. C.E. Abstracts of Foreign Papers.

METEOROLOGICAL PROPHECIES.—A rapid rise of the barometer is now going on, and miners are urged to be extremely cautious against danger from gas escapes and accumulations. One certainly cannot see what value there is in these warnings, seeing that mining engineers are agreed that there are other considerations that affect exudations of gas in mines than barometrical pressure, temperatures, according to some of the most eminent of them, having most to do with them. Meteorological observations and colliery explosions have been put as cause and effect, when in fact they were simply recorded incidences, seeing that there has not been a case in which correlation has been established. With respect to the great storm, it may be of interest to some persons to know the state of the barometer in one locality, where the visitation was particularly strong. At Leeds the recording aneroid barometer began to fall at 6 P.M. on Tuesday evening, and by 10 o'clock it had gone down nearly an inch. At midnight it fell quickly about a tenth, and at 2.15 A.M. it again went down another tenth, and during the next two hours it was stationary. At noon on Wednesday the barometer stood at 29.75. In the morning the state of the weather was recorded as follows:—Barometer, 29.508; attached thermometer, 53°; dry bulb thermometer, 42°; wet bulb, 40°; direction of wind, west; force of wind equal to about 16 lbs. on the square foot.

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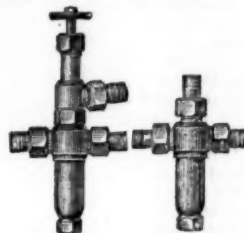
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ANTI-CORRODING TUBES AND FITTINGS COATED BY BARFF'S RUSTLESS PROCESS.

TUBES

COMPOUND DIVISION READY RECKONER.

The handsome and admirably printed volume compiled by and printed for Mr. WILLIAM WETHERED, of Bristol, may be regarded as a monument of patient industry, although, unfortunately, nothing favourable can be said with regard to its utility. Most of the calculations can be made more quickly without the Ready Reckoner than with it, and the operator of ordinary ability will have far greater confidence in the accuracy of his results when he has obtained them without the confusion of the tables. The author states that the work is designed "for quickly calculating any number of articles in pence and three places of decimals of a penny," but this is not at all what he means, nor will the Ready Reckoner aid the performance of the operation indicated. He means that if the value of a given number of articles (from 1 to 10,000, and thence by tens to 100,000) be known the price of each can be ascertained by the use of his tables. This is true, provided the operator be reasonably expert in the manipulation of decimals, but in page IV. of his preface Mr. Wethered has made three blunders in half-a-dozen lines, which he has had to correct by a sheet of "errata;" if the tables be equally accurate most people would prefer direct calculation, even if it occupied a little more time. He intends the tables "for use in making out cost-sheets in collieries, ironstone and other mines, iron, gas, and water works, quarries, and manufactories generally. For accountants, merchants, public and private offices, and wherever the cost of a gross number is required to be reduced to 1 in 0.000." We will ascertain the relative brevity of calculating with and without the Ready Reckoner by taking a few of the test questions which Mr. Wethered sets himself and answers, first repeating what has many times been printed in the *Mining Journal* as to expressing fractions of 11. in decimals thereof. The figure in the first decimal place represents florins; the figure in the third decimal place represents farthings, but for simplification and greater accuracy we remember that (instead of '024) '025=6d. Now, Mr. Wethered seeks to know if 6132 lbs. of wool cost 1635l. 16s. 4d. what is the price per pound?

WITHOUT READY RECKONER.	WITH READY RECKONER.
6132)1635.816(266=5s. 4d.	£1000=39.139 Rule 1
409.41	600=23.483 " 1
41.496	30=1.1742 " 2
4.704	5=.1956 " 3
	16s.=8-10=.0313 " 4
	6d.=.001

64.024d.=5s. 4.024d. per lb.

Here the error without the tables is less than one-fortieth of one penny. We write the gross sum as 1635 pounds 8 florins and 16 farthings, divide (using Italian division) by 6132, and obtain the result 0.266—that is, 2 florins 2 sixpences and 16 farthings, or 5s. 4d. If the fraction of a penny less than a farthing be required it can quite as easily be obtained by carrying the division to the fourth place of decimals. Take another of his examples and test it against the same process of conversion and reconversion of fractions and Italian division as before:—If 322,000 ft. of gas have cost 219l. 13s. 6d. how much is that per 1000?

WITHOUT TABLES.	WITH TABLES.
322)219.675(682=13s. 7½d.	£200=149.068d. Rule 1
26.47	10=7.453d. " 2
715	9=6.708d. " 3
71	12s.=6-10=.447d. " 4
	18d. at foot=.056d.

163.732d.=13s. 7.732 per thousand feet of gas.

Here the error is less than one-fiftieth of one penny. It may be repeated that the first conversion reads 219 pounds 6 florins and 3 sixpences. In the reconversion of the result we read 6 florins 3 sixpences and 7 farthings=13s. 7½d. It will be seen that the conversion of 0.682 to 13s. 7½d. requires no more mental effort than the conversion of 163.732d., which Mr. Wethered obtains by a much more labourious process. The author states that his work is the first Compound Division Ready Reckoner published, and it will probably be the last. The amount of labour bestowed upon the book must have been enormous, and it is regrettable that so little benefit either to the author or to the public is likely to result from it. The volume will form a handsome ornament in the colliery or other office, but will be generally regarded as ornamental only.

MULTIPLE ACTION STONE BREAKER.

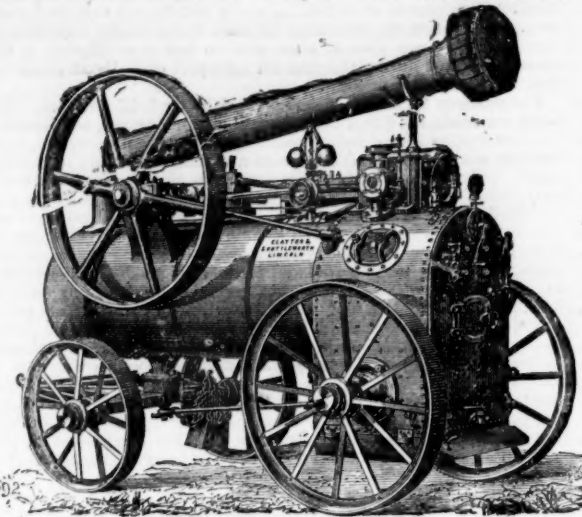
The improvements which have been submitted within the last few years with a view to combine in one machine the two operations of breaking up and grinding or pulverising have been very numerous, but it is found that these cannot be successful in a commercial sense, as the two processes are different in character, and require opposite modes of treatment. To accomplish the work satisfactorily Mr. C. E. HALL, of Sheffield, arranges his preliminary crusher above a pair of corrugated or plain rolls and supports the whole on a timber framing. Where a fine reduction is necessary, such as in the case of tin, copper, lead, gold, quartz, silver ore, &c., he has designed his patent universal pulveriser, in which the roll shells are of steel, and with an arrangement of slide rest and screw, with a turning tool moving across the face of the said rolls to turn them true as they are rotated in the opposite direction to that when crushing; he is thus able to keep an even and true roll surface. With the application of his patent adjustable expansion link to the rolls, he is able to bring a definite pressure (up to any quantity) upon the material under treatment, and thus produce with rolls a finer and more even sample than that produced by roller machines hitherto. He has adhered to a well known and tested principle; his improvements have been directed to the points of failure and improvement thereon, and he claims to have produced a machine well suited to the work required, and better than any other maker can offer.

In connection with the treatment of mineral Mr. Hall is also introducing an improved elevator and drive chains. It is well known that many of the detachable chains proposed have proved unsatisfactory, but the closed links recently introduced and put into extensive use by Mr. Hall for the bucket elevators and the creepers made by him as part of the plant in connection with stonebreaking, coal grinding, and other crushing machinery, and also for general purposes where elevating machinery is applied seems to work admirably. In this chain, which is essentially adapted for a high speed and light loads, all the links are the same, and coupled and uncoupled in the same line. A flat is formed across the bar of the male end of the link, which reduces the dimension, and thus admits of the links being attached or detached. The link then being turned cannot slip out of place, because the crossbar fills the hook. When the link is turned into any working position the flat part has no bearing on the hook or female part, and hence may be made without affecting the strength or durability of the chain. Circular pulleys of the simplest form, with short teeth set to the pitch of the chain, are all that are required, or renewable dog-toothed spikes bolted into the run of a pulley will answer. This particular chain is adapted for use in driving various motions in all classes of machinery, to agricultural implements, and other machinery in the open where belting would suffer from exposure, such as in mining machinery, buddles, elevators, &c. The maker claims that his is the only detachable chain in which all the links are made alike, and in which no special links are required for the bucket or other attachment. Every link is interchangeable. The links of the chain lie flat on the side of the toothed drum when travelling round it, and do not, therefore, depend upon the teeth alone for their driving power. For heavy work they are made, both for driving and elevating purposes, of stamped wrought-iron, but for most purposes it is found that malleable iron or well annealed steam castings are the most suitable. These chains are now in extensive use at various mines and collieries, and in every case have given complete satisfaction.

HOLLOWAY'S PILLS are strongly recommended to all persons who are much reduced in power and condition, whose stomachs are weak, and whose nerves are shattered. The beneficial effects of these pills will be perceptible after a few days' trial, though a more extended course may be required to re-establish perfect health. Holloway's medicine acts on the organs of digestion, and induces complete regularity in the stomach, liver, bowels, and kidneys. This treatment is both safe and certain in result, and is thoroughly consistent with observation, experience, and common sense. The purification of the blood, the removal of all noxious matter from the secretions, and the excitement of gentle action in the bowels, are the sources of the curative powers of Holloway's Pills.

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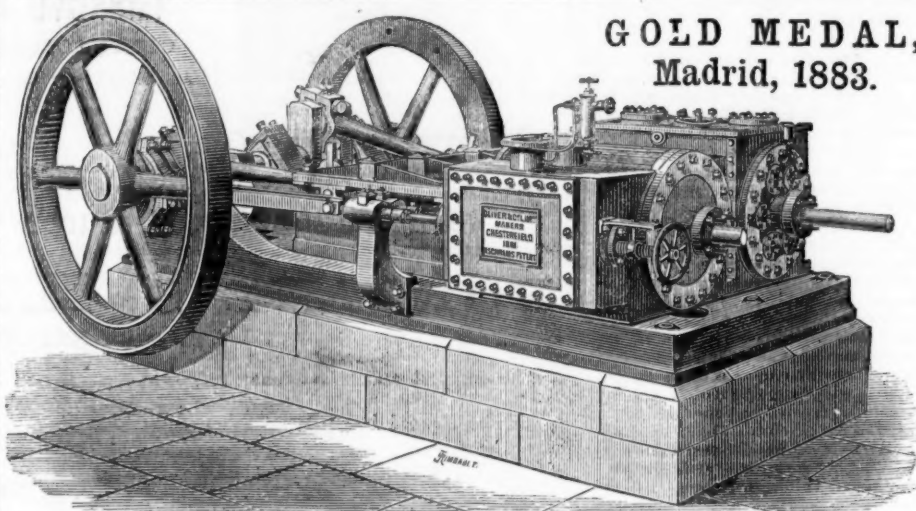
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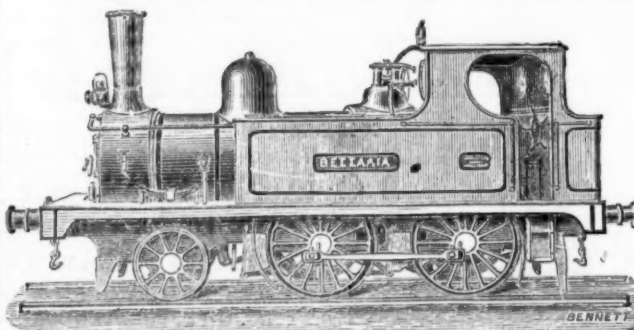
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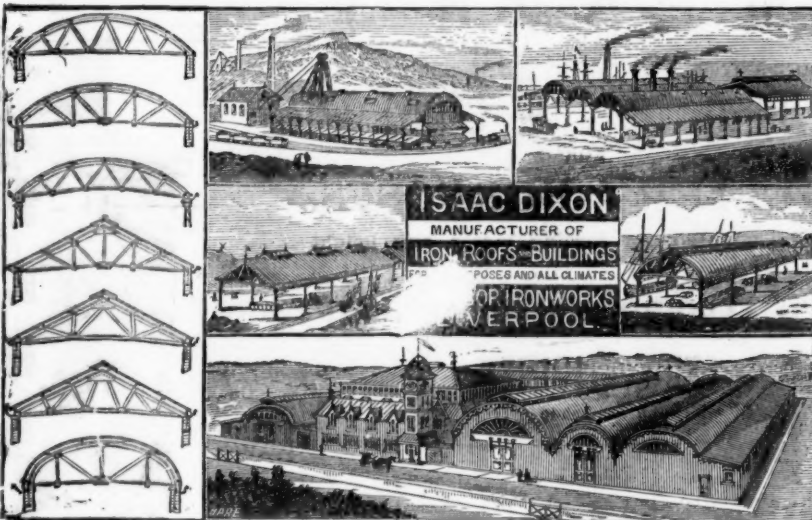
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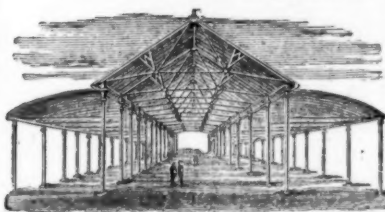
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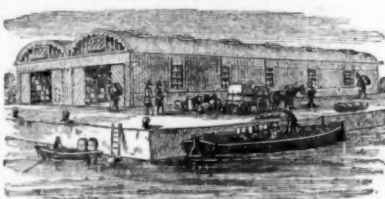
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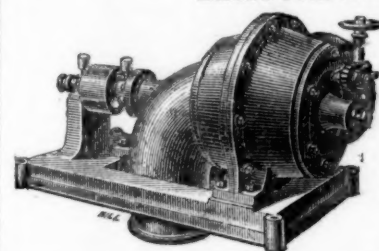
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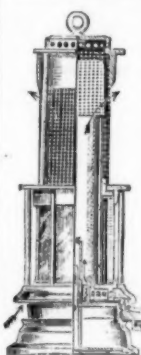
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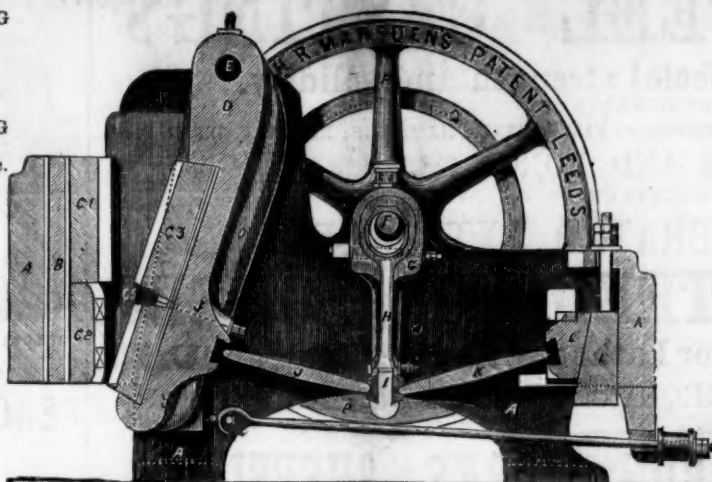
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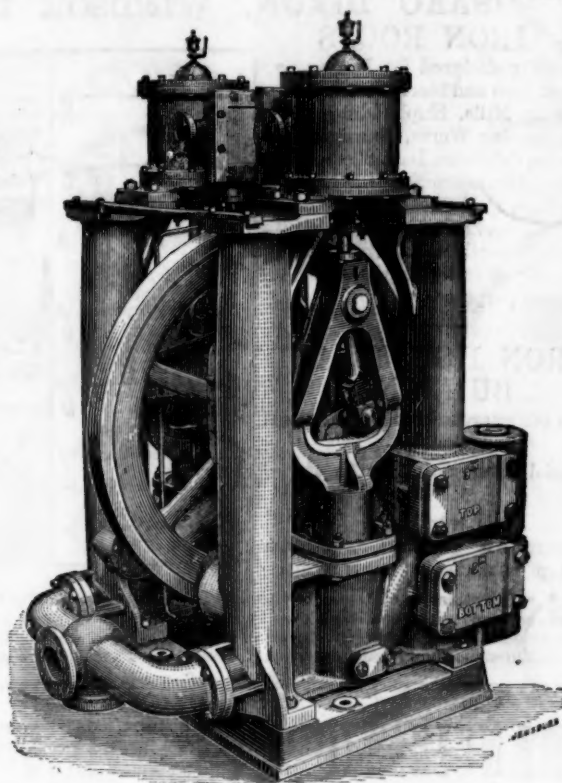
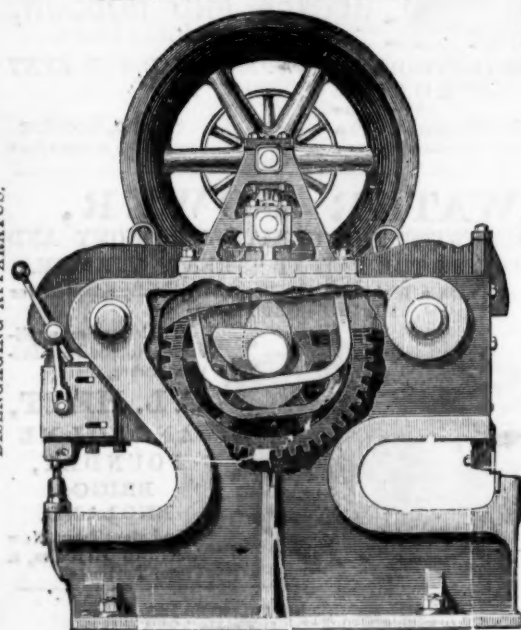
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